







DEDICATED TO

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SUPERINTENDENT OF H. C. BOTANIC GARDEN, AND VICE PRESIDENT  
OF THE AGRICULTURAL AND HORTICULTURAL SOCIETY.

AS A SMALL TRIBUTE OF RESPECT FOR THAT ZEAL

WHICH, WHILE EFFECTIVELY EMPLOYED

ON THE HIGHER WALKS OF BOTANIC SCIENCE,

COULD CONDESCEND TO CONSULT THE GOOD OF SOCIETY,

BY AFFORDING HIS ABLE ASSISTANCE

IN PROMOTING THE HORTICULTURE OF INDIA;

BY

THE AUTHOR.

CALCUTTA, APRIL 30<sup>TH</sup>, 1840.





## P R E F A C E.

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The present little work is offered to the public, aspiring to no pretensions of merit to solicit patronage; its only claim to attention being, that it is the first attempt to embody in one work the practice of the Indian Gardener. It pretends not to originality of design or execution, being in this respect a mere compilation; but as no one has yet attempted to adapt the Horticulture of other climes to this, or given to the world the results of their experience in this so desirable an art, as far as luxury and comfort are concerned, the author has ventured throwing together, in a convenient form, such rules as have occurred to him in the practice of the few years he has paid attention to the subject; and all he can say in its favour is, that none of those here laid down are speculative, all the results offered having occurred in the course of his own practice or observation. Aspiring not at perfec-

tion, he seeks but to lead the way in a walk hitherto untrodden; and hopes that his errors, where they occur, may induce others to follow him with better success, until the delightful art of Horticulture shall become a beaten way, smoothed for all who may have the good taste to aspire at raising into realities the fabled gardens of the East.

# SUPPLEMENT

TO THE

## Indian Hand-Book of Gardening.

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### HINDOOSTANEE AND ENGLISH VOCABULARY

OF

HORTICULTURAL AND AGRICULTURAL TERMS.

—000—

*Compiled chiefly from the Reverend J. T. Thompson's "Dictionary in Oordoo and English." Serampore, 1838.*

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a.	e.	i.	o.	u.	ee.	oo.	oo.	ou.	d.
all.	they.	in.	so.	but.	steel.	good.	pool.	our.	deal
<i>d</i>	<i>g.</i>	<i>gh</i>	<i>k.</i>	<i>kh</i>	<i>n</i>				
[soft dental]	gum.	[guttural.]	keel.	loch	[nasal, <i>bon.</i>				
<i>q.</i>	<i>r</i>	<i>t.</i>	<i>t</i>	<i>y.</i>	<i>zh.</i>				
[deep liquid lingual.]	harsh	palatick.	tin.	soft dental	you	azure.			

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#### A.

- Ab, water. Abi,ba,ran ; rain, rain-water.
- Ab,sal, a vine-yard, a garden.
- Ab,ya,ree, irrigation, watering.
- Ak, curled flower, gigantic swallow wort (*asclepias gigantea*).  
a sprout of sugar-cane.
- A,kash,neem, a parasite plant peculiar to the neem tree (a species of *epidendron*).
- A,kash,puwun, a species of parasitical dodder or air plant (*cuscuta reflexa*).
- Al, the broad leaved citrifolia (*morinda citrifolia*) from the root of which a red dye is extracted for leather, silk, &c.

A, lat, instruments, tools, utensils.  
 A, loo, a potatoe ; an esculent root (*arum companulatum*) : see ol.  
 A, lóo, bookhara, a damascene.  
 A, loonj, a wild plum, a sloe.  
 A, loo, shamee, a damson, a Syrian or Damascus plum.  
 Am, the mango tree (*mangifera indica*) ; and mango fruit.  
 Am, la, or Auon, la, the emblic myrobalan (*phyllanthus emblica*).  
 An, thee, stone of fruit, coagulation.  
 A, ra, or A, ree, a saw.  
 A, ree, ya, a plant of the gourd kind.  
 A, roo, a peach.  
 As, the myrtle.  
 A, suf, the caper tree (*capparis spinosa*).  
 A, sun, a species of terminalia on which the tusui silk-worm  
     feeds (*T. alata tomentosa*).  
 At, custard apple (*annona squamosa* or *reticulata*).

## B.

Ba, boo, nuh, camomile, wild ivy.  
 Ba, dam, an almond.  
 Ba, l, rung, a sort of cucumber.  
 Bagh, a garden, grove, orchard.  
 Bagh, ban a gardener. Bagh, bane, gardening.  
 Bagh, chuh, or Baghee, chuh, a small garden, a garden.  
 Baj, ra, Indian corn (*holcus spicatus*).  
 Baq, la, the common kidney bean [*phaseolus vulgaris*].  
 Ba, kus, the Malabar-nut and the willow-leaved *Justicia* (*J. adha-*  
     *toda*: *J. genderussa*).  
 Ba, leed, gee, vegetation, growth, increase.  
 Ba, loo, sand.  
 Ba, lum, khee, ra, a species of cucumber in season in the rains (a  
     variety of *cucumis sativa*).  
 Bamh, nee, a medicinal herb, the moon plant.  
 Bamun, huttee, name of a plant (*ovieda verticellata*).

Ban, a species of the storax tree, yielding benzoin (*styrax benzoe*) ;  
 a sweet scented tree called by the Persians *bed mooshk*.  
 Ban,*da*, a species of parasite plant. *Epidendrum* (particularly—  
*E. tesallatum*).  
 Banjh, (adj.) barren. Ban,jur, lying waste or fallow (land).  
 Baus, a bamboo : hence also a long measure.  
 Bao,lee, a large well.  
 Bar, fruit, load, burden, heaviness.  
 Bar,wur, (adj.) fruitful, producing fruit.  
 Ba,ree, an enclosed piece of ground, whence also garden, orchard, &c. ; a house with the garden, &c. attached to it.  
 Ba,rish, rain.  
 Bas or Boo, smell, scent, odour.  
 Bed, a willow, a species of cane, a ratan (*calamus rotang*).  
 Bed,mooshk, an odoriferous willow.  
 Bee-gha, a measure of land, containing 20 kutthas, or 14,400 square feet.  
 Beej : Beehun : Bihun : or Bina, seed. Bee-jar, seedy.  
 Beg, dung.  
 Bekh, root, origin, foundation.  
 Bel, the thorny Bengal quince (*crataeva* or *ægle marmelos*) : a creeper, climber, tendril (of a vine).  
 Bel, a spade.  
 Bel or Be,la, the single Arabian jasmine (*jasminum sambac*).  
 Bel,boo,ta, a shrub, bush, or creeper.  
 Bel,chuh, a hoe, a spade, a small mattock.  
 Bel,uk, a small mattock.  
 Be,na, the name of a grass, *khus* (*andropogon muricatum*).  
 Ber, or Be,ree, the jujube tree or fruit (*zizyphus jujuba*).  
 Ber,ha, paling, railing : *adj.* crooked.  
 Bet, a cane, a ratan (*calamus rotang*).  
 Bhant, a medicinal plant (*clerodendron infortunatum* ; *volkameria infortunata*).

Bhan,ta, the egg plant (*solanum melongena*).  
 Bhek, or Beng, a toad, a frog.  
 Bhet,ee, or Bhet,oo, a stalk, a stem.  
 Bhel,a, the marking-nut *semecarpus* tree [*S. anacardium*].  
 Bhil,a,wan, the nut. Bhil,oun,jee, the seed of the nut.  
 Bhin,dee, a vegetable (*hibiscus esculentus*).  
 Bhint,was or Bhunt,was, a grain, the fruit of the Koe or water-lily.  
 Bhoj,puttur, the bark of a species of birch tree.  
 Bhoo, earth. Bhoo,tul, under the earth, the earth.  
 Bhoo,a, or Bhoo,een, a worm, a caterpillar.  
 Bhoo,een,chumpa, or Bhoo,a,chumpa, the round-rooted galangal (*kœmpferia rotunda*).  
 Bhoom, or Bhoon, land, earth, the earth.  
 Bhoond,lee, a kind of worm covered with hair.  
 Bhoor, sandy ground, soil in which much sand is mixed.  
 Bhoot,ta, Indian corn (*zœa mays*).  
 Bhoo,wung, a snake or serpent.  
 Bhring,raj, a medicinal herb (*eclipta* or *verbesina prostrata*).  
 Bhum-beree or Bhum,bheree, a butterfly.  
 Bhung, Bang or Bi-juya, common hemp (*cannabis sativa*).  
 Bhung,ra, a herb (*eclipta* or *verbesina prostrata*).  
 Bhun,wur, or Bhoun,ra, a climbing plant, a creeper, a large black bee.  
 Bhur,bhand, a prickly poppy (*argemone Mexicana*).  
 Bhut,kuta,ee or Bhut,kuty,ya, a prickly plant, Jacquin's night-shade (*solanum Jacquinii*).  
 Bich,a,lee, straw.  
 Bich,ha,ta, a stinging nettle (*urtica interrupta*).  
 Bich,hoo, [vulgarly—Kekra Bich,hoo,] a scorpion.  
 Bih, or Bi,hee, a quince. Bi,hee,danuh, quince seed.  
 Bimb, great flowered Bryony [*Bryonia grandis*]: a species of *mordica* [*M. monadelphia*].

Bin,ou,la, the seed of the cotton-tree [said to be fattening food for cattle].  
 Bir,kuh, a pond, a well, a reservoir for water.  
 Bir,nan, a tree growing in Ajmere, used for making rosaries.  
 Birnee, a small grain, a wasp.  
 Bir,tee, a plant [a species of panicum].  
 Birwa, a plant, a tree.  
 Bir,wa,hee, an orchard. *Bir,wa,hee Kurna*, to make an orchard, to enclose with a hedge.  
 Bis,fa,ij, a medicinal root, polypody.  
 Bish,tee, rain.  
 Bis,khup,ra, a medicinal plant [trianthema pentandra].  
 Bis,wa, or Bis,wuh, a measure of land.  
 Bit,teekh, a musk melon.  
 Bit,up, a tree, a twig.  
 Bol, myrrh.  
 Bo,na, to sow.  
 Bon,dee, the germ of a plant. Bont, a stalk.  
 Boo,qool, plants.  
 Boont, or Boot, a kind of pulse, common chick-pea [*cicer arietinum*].  
 Boos,tan, or Bostan, a garden, a flower-garden.  
 Bora, a kind of bean, like French beans [*dolichos catsang*].  
 Bound, a creeper, a vine.  
 Brichh, or Briksh, a tree, a plant.  
 Bub,oo,ree, Bub,oor, or Bub,ool, a tree of the mimosa kind. there are several species, but the most usually found, is Arabica or gum-arabic tree.  
 Bu,by, the seed of a sweet scented herb [*ocymum pilosum*].  
 Buch, orris root.  
 Rug*h*,i,ya, a small garden, or orchard.  
 Bug,ren,dee, the angular-leaved physic-nut [*jatropha curcas*].  
 Bu-har, spring, prime, bloom, beauty.



- Bu,her,a, a fruit [the belleric myrobalan; terminalia bellerrica].
- Bu,hoo,ar, species of plum [cordia myxa and cordia latifolia].
- Buk,a,yun, Persian lilac tree [melia sempervirens].
- Buk,chee, a plant; the seed of which is used to cure the itch [conyza or serratula anthelmintica].
- Buk,kul, or Buk,la, bark, skin, rind, shell [of a fruit].
- Buk,lut,ool,humqa, [the stupid herbage] purslain.
- Bu,kool, a mimosa tree [mimosa elongi].
- Buq,um, sappan or red wood [sappan cœsalpinia].
- Buqs, the box tree.
- Bul,a, a medicinal plant, species of sida [sida rhombifolia, rhomboidea, and cordifolia].
- Bul,oot, an acorn, an oak, a chesnut tree.
- Bul,tar, the male palm or toddy tree [borassus flabelliformis].
- Bumba, a well, a jet d'eau, the spout of, a fountain, [corrupted from *Mumbuh*].
- Bun,da, misletoc, a kind of epidendron [E. tesselloides].
- Bunj, henbane.
- Bun,jur, waste land.
- Bun or Bun,khund, a wood or forest.
- Buns, a bamboo. *Buns,lo,chun*, the manna or sugat of bamboo, which contains much siliceous earth.
- Bun,tur,a,ee, name of a plant, a species of luffa.
- Bunuf,shuh, a violet.
- Bur, the Bengal banyan or fig-tree [figus Bengalensis or Indica].
- Bur,dee, the Egyptian papyrus.
- Burg, a leaf. *Burg,i,gool*, leaf of a rose.
- Bur,na, or Bur,oon, the smooth garlick-pear [crataeva tapia].
- Bur,oon,kha, a kind of sugar-cane with long joints.
- Bur,sat, the rainy season, the rains.
- Bus,tu,ra, a plant (calicarpa Americana).
- Bus,ul, an onion.

But,hoo,a, a kind of greens or pot-herb (*chenopodium album*); orach.

Buz,baz, or Bus,bā,suh, mace (the spice so called).

By,gun, or Byn,gun, the egg-plant [*solanum melongena*].

By,sak,hee, a large kind of myrobalan or citron fruit. (adj. growing in the month of Bysakh or relating to that month).

## C.

Cha,een, the seed of the tamarind.

Chah, a pit, a well. Chah,kun, a well-digger.

Chand,nee, name of a flower: the moon-beams.

Char,mughz, a walnut.

Cha,ruh, a young plant.

Chas, a plough. Chas,a : a ploughman, a husbandman.

Check, Chee,kur, or Cheekna, mud, slime, (corrupted from *keech*).

Cheek,hoor, a squirrel. See *Gillhuree*.

Cheer, the pine tree (*pinus longifolia*).

Chee,ta or Chit,ta, a medicinal plant (*plumbago zeylanica*.)

Chemp, the acrid resin of fruits and trees.

Chen,a, millet, (*panicum Italicum*.)

Che,ry,ta, the gentian plant (*gentiana cherayta*)

Chha,li,ya, a kind of betel-nut.

Chhee,mee, a pod, legume, husk.

Chhoo,ha,ra, a date [*phoenix dactylifera*].

Chhuj, Adj. Bushy.

Chhuj,ja, the expanded branches of a tree.

Chhur,ee,la, a kind of fragrant moss.

Chil,gho,zuh, a nut like the pistachio, or the kernels of the pine.

Chin,ar, a poplar tree, a plane tree.

Chip,ta,na, (a. v.) To sod, to turf, to apply patches.

Chir,chir,a, or Chir,chir,a, rough achyranthes (*A. aspera*).

- Chir,i,ya, a bird. Chir,i,ya,khan,uh, an aviary.
- Chob,chee,nee, China-root (smilax China).
- Choo,ka, a kind of sorrel [rumex vesicarius].
- Chookh, orris-root, orrice, or iris-root, a medicine.
- Chook,kur, a small square tank or pit.
- Choo,qun,dur, or Chich,in,da, beet root [beta vulgaris].
- Choos,see, the juice of fruits.
- Chou,la,ee; a kind of vegetable [amaranthus polygamus].
- Chou,mook,hee, the seed of a tree called *Roo,druksh*, the purslane-leaved scævola (S. lobelia).
- Chou,ree or Chou,bar, a summer house.
- Chub,oo,tur,ah, a garden terrace or mound to sit on.
- Chuch,ra, the name of a tree.
- Chuft, or Chuf,tuh, a prop, an arbour.
- Chug,er, or Chunger, a flower pot.
- Chuk,ot,ur,uh, a fruit of the lime kind, a citron; pom,pel, moose, or shaddock [citrus decumanus].
- Chuk,oun,da or Chuk,onr, a species of the cassia (C. obtusifolia), esteemed a remedy for ringworms.
- Chul,ta, a tree producing an acid fruit [dillenia indica].
- Chum,bel,ee, catalonian jasmine (jasminum grandiflorum).
- Chum,pa, the sweet-scented michelia (M. champaca).
- Chum,pa,ke,la, a superior kind of plantain.
- Chum,un, a bed in a garden, a parterre, flower-garden.
- Chun, a kind of sugar-cane.
- Chun,a, a kind of pulse, chick-pea (cicerarietinum), vetches.
- Chun,ar, a plane tree, poplar.
- Chun,dun, sandal-wood or tree (sirium myrtifolium).
- Chun-soor, cress, cresses (lepidium sativum).
- Chun,uk, the bursting of a husk of seed by exposure to the sun.
- Chur,ao, pasture-ground.
- Chy,na, a kind of millet.

## D.

- Dab*, a species of meadow-grass (*poa cynosuroides*). An unripe cocoanut.
- Dahl*, a forest.—See also, “*Bun*.”
- Dal*, *mur*, *dun*, a plant used to cure the ringworm (*cassia alata*).
- Dakh*, a raisin, a grape.
- Dal*, pulse, vetches, a branch, a bough. *Da*, *la*, a large branch.
- Dan*, *gur*, the flowering stem of radishes or mustard.
- Dant*, *hee*, a straw, stubble, pedicle, stalk.
- Dant*, *hul*, pedicle, petiole, foot-stalk.
- Dao*, a bill, or kind of hatchet with a hooked point.
- Da*, *oo*, *dee*, Indian chrysanthemum (*C. Indicum*).
- Dar*, *chee*, *nee*, cinnamon.
- Dar*, *fil*, *fil*, long-pepper. *Fil*, *fil*, pepper.
- Da*, *rim*, or *Da*, *rim*, a pomegranate (*punica granatum*).
- Das*, or *Da*, *sa*, a sickle, a scythe, or reaping-hook.
- De*, *a*, *ra*, a white-ant hill.
- Deb*, *dar* or *Deo*, *dar*, the mast tree [*uvaria longifolia*].
- Dee*, *ha*, a bank, a mound.
- Dee*, *muk* or *Dee*, *wuk*, white-ant.
- Dee*, *wal*, or *De*, *war*, a wall.
- Del* or *Del*, *a*, a lump of earth.
- Deo*, *kun*, *dur*, water cresses.
- Deona*, *mur*, *wa*, a species of basil shrub [*occimum*].
- Dev*, *da*, *roo*, a medicinal species of uvaria [*U. longifolia*].
- Dhak* or *Dhak*, *ha*, downy branch, butea tree [*butea frondosa*].
- Dhan*, the rice-plant, or rice before separated from the husk.
- Dhan*, *gur* or *Boonwah*, a hill people whose most usual business it is to dig the earth, clean drains, &c.
- Dhao*, the downy grisea [*G. tomentosa*].
- Dha*, *ree*, a species of lythrum [*L. fruticosum*], downy grisea.
- Dhen*, *dus*, or *Dhen*, *rus*, a species of vegetable [*hibiscus esculentus*].
- Dhen*, *kee*, a machine for pounding with.

*Dhen,ree*, the capsule of the poppy [or of the cotton tree], a poppy-head.

*Dhim,cha*, a species of tamarind.

*Dho,a*, fruit and flowers presented by inferiors on festival days.

*Dhond*, a capsule or seed-vessel [especially of the poppy].

*Dhond,ha*, a small mound of earth.

*Dhoo,a*, a bank, a mound, a clod of earth

*Dhool* or *Dhoor*, dust.

*Dhoo,ri,ya,bel,a*, a species of jasmine.

*Dhoor,wa*, a pea.

*Dhun,i,ya*, coriander-seed [*coriandrum sativum*].

*Dhur,tee,ka,phool* [*from Dhur,tee,—earth*], a mushroom.

*Dhut,oo,ra*, a datura or thorn apple plant.

*Dig,hce*, a large tank or reservoir.

*Do,puh,riya*, the scarlet-flowered pentapetes [*P. phœnicea*].

*Dol*, a bucket. *Dol,chuh*, a small bucket.

*Doob*, a kind of grass [*agrostis linearis*].

*Dood,dhee*, a medicinal herb [*euphorbia hirta* and *thymifolia*].

*Dood,hee* or *Dood,hi,ya*, [adj.] milky, containing milky juice [subs.] name of several plants with milky juice; as various species of *asclepias*, *echites*, *euphorbia*, &c.

*Droom*, a tree in general.

*Dul*, the leaf of a tree. Wild rice.

*Dum,eed,gee*, blowing [of a flower], sprouting.

*Dur,an,tee*, a sickle.

*Dur,ukht*, or *Durkut*, a tree. *Dut,ha*, a stalk.

*Dyh,na,-* a branch, a bough.

## E.

*E'lwa*, aloes (*aloe perfoliata*).

## F.

*Fa,lez* or *Pa,lez*, a field of melons.

*Fa,shi,ra*, the plant bryony.

*Fir,in,gee,dha,too,ra*, the Mexican argamone (*A. Mexicana*).

Fin,dooq, the filbert-nut.

Fou,ful or Foo,ful, the betel-nut.

Fukh,ree, a kind of grape so called.

Furu, a bough, a branch (of a tree, particularly the top branches).

## G.

Gad,da, a bulb, a nutritious root of any kind.

Gab, a species of date-plum tree (*diospyros glutinosa*, or *embryopteris glutinifera*) the fruit of which contains a glutinous, astringent juice, used for the bottoms of boats, nets, &c.

Gab,ha, a new leaf springing from the centre of a plantain tree.

Gachh, a tree.

Gaj,ur, a carrot (*daucus carota*).

Gal,a, a pod of cotton.

Gan,da, sugar-cane.

Gan,dur, a kind of grass of which khus-khus is the root (*andropogon muricatus*).

Gan,jur, a kind of grass or verdure.

Ge,hoon, wheat. *Ge,hoon,an*, the colour of wheat a sort of grass.

Gec,ah, grass, herbage.

Gen,da, a marigold ; a ball.

Ghagh,ra, the Indian xanthium (*X. Indicum*).

*Gha,ree,koon*, species of agaric.

Ghas, grass, straw. Ghat,pat, sweepings.

Gheek,war, a medicinal aloe plant (*aloe perfoliata*).

Ghee,la, the name of a very large wild creeper.

Ghi,ya, the bottle gourd (*cucurbita lagenaria*).

*Ghi-ya-tor-uee*, a species of luffa (*L. pentandra*).

Ghon,ga, a snail (*cochlea helix*), a cockle.

Ghoom,ra, a species of phlomis, an insect.

*Ghoon,chuh*, a bud, blossom.

Ghoong,chee, the red and black seed of the Jamaica wild-liquorice (*abrus precatorius*).

Ghoud or Ghour, a bunch or cluster of grapes, dates, or plantains.

- Gho,yam, Egyptian arum (arum colocasia).  
 Ghur,a, an earthen water pot.  
 Gil,hu,ree or Gil,e,ree, a squirrel. Also—*Cheek, hoor*.  
 Gird,gan, a walnut, a pellet, &c.  
 Gi,yah, grass, straw, green herbage.  
 Go,bhee, a species of medicinal hawk weed (hieracium). *Soofyd*  
*Go,bhee*, sow-thistle-leaved cacalia (C. sonchifolia).  
 Go,bur, cow-dung.  
 Godh,ra, or *Good,daa*, a bough, a branch.  
 Gon,dee, a species of the cordia tree.  
 Goo,a, betel nut.  
 Gooch,chha, a bunch, a cluster (of fruit), ear of corn.  
 Goo,gul, name of a tree or gum (amyris agallocha) ; bdellium.  
 Gool, a rose, a flower.  
 —,acheen, a species of plumieria.  
 —,i,ushruffee, a species of marygold (calendula), three-styled  
   . flax (linum trigynum)  
 —,unas kee jur, salep.  
 —,boon, a rose-bush.  
 —,burg, a rose-leaf.  
 —,piyaduh, a species of rose without scent.  
 —,i,ja,fur,ec, French marygold (tagetes patula).  
 —,cheen, a flower-gatherer, a gardener.  
 —,i,khy,ra, Chinese and Persian holly-hock ; (althea rosea).  
 —,i,daoo,dee, Indian chrysanthemum (C. Indicum).  
 —,i,rana, a beautiful, delicate scented rose.  
 —,zar, a garden (or bed) of roses.  
 —,i,soorunjan, flower of the hermodactyl plant (colchicum illy-  
   ricum).  
 —,i,soorce, a Persian rose, very fragrant.  
 —,i,sosun, a lily.  
 —,shubbo, tube-rose (polianthes tuberosa).  
 —,i,sud,burg, rosa glandulifera.  
 —,i,toorruh, the flower-fence poinciana (p. pulcherrima).  
 —,ubbas, the common marvel of Peru (mirabilis jalapa).  
 —,i,ujaib, the changeable hibiscus (H. mutabilis).

- Gool*, i, furung, the Madagascar periwinkle (*vinca rosea*).  
 —, kesh, the cockscomb flower (*amaranthus cruentus*).  
 —, luhunah, cauliflower.  
 —, mukhmul, globe amaranth (*gomphrena globosa*).  
 —, mihndee, garden balsam (*impatiens balsamina*).  
 —, ab, a rose (*rosa centifolia*) : rose-water.  
 —, ab, ja, mun, a rose-apple (*eugenia jambos*).  
 —, chik, an, the flowers of muhooa (*bassia latifolia*).  
 —, is, tan, a rose-garden.  
 —, nar, or *Gooli*, un, ar, the flowers or blossoms of the pomegranate  
*Goo*, lur, a wild fig (*ficus glomerata*).  
*Goo*, ma, the plant ladies' bedstr. pharnaceum (*P. mollugo*).  
*Goonj*, the seed or the shrub of the abrus precatorius.  
*Goorch*, a creeping-plant (*menispermum glabrum*).  
*Goor*, hul, the althæa frutex hibiscus (*H. syriacus*).  
*Gooth*, lee, a kernel, stone, seed.  
*Gou*, chhuce, a sprout.  
*Gou*, ri, ya, a sparrow.  
*Gud*, dur or *Gud*, ra, half-ripe (fruit).  
*Gul*, gul, a citron, a bird.  
*Gundh*, raj, the Cape jasmine [*gardenia florida*].  
*Gundun*, a, a leek [*allium porrum*].  
*Gur*, ee or *Giree*, the kernel of a cocoanut (properly—*giree*).  
*Gur*, ha, a cavity, a hole, a pit.  
*Gur*, o, na, [v. a.] to pierce, perforate, bore, stick into.  
*Guz*, a measure, a yard, ; tamarisk.  
*Guz*, nuh, a species of nettle. *Guz*, ur, a carrot.  
*Gy*, na, a bush, a small bullock. *Gwa*, la, a cowherd.  
*Gynt* or *Gyn*, tee a pickaxe.  
*Gy*, ra, a sheaf (of corn).

## H.

- Ha*, lim, cresses (*lepidium sativum*).  
*Ha*, pur, a seed-bed, or rather nursery.  
*Har*, jora, the square stalked cissus (*C. quadrangularis*).  
*Hath*, phool, a species of pothos plant.



- Hatla,joree*, a species of club-moss (*Lycopodium imbricatum*).  
*Hen,ga*, a harrow for breaking clods.  
*Hind,ba*, a white seed, endive, succory (*Cichorium endivia*).  
*Hin,dwa,nuh*, a water-melon.  
*Hin,na* or *Hina*; the henna-plant lawsonia (*L. inermis*).  
*Hir,a,sut*, agriculture.  
*Hool,ba*, fenugreek.  
*Hool,hool* and *Hoor,hoor*, species of cleome.  
*Hoom,maz*, sorrel  
*Houz*, a reservoir, the basin of a fountain, a tank, vat.  
*Hubb*, a berry, grain of corn, seed, fruit, &c.  
*Hul*, a plough. *Hul-jota*, a tiller, a ploughman.  
*Huldee*, turmeric (*curcuma longa*).  
*Hul,ee,la*, an astringent nut, myrobalan.  
*Hun,si,ya*, *Hun,soo,a*, or *Hussooah*, a sickle.  
*Hun,zul*, coloquintida apple.  
*Hur,da*, mildew, smut (in corn).  
*Hur,huft*, a narcissus.  
*Hur,jo,ra*, a medicinal plant (*cissus quadrangularis*). see "*Harjora*."  
*Hur,kut*, *acanthus ilicifolius*.  
*Hur,pha,revrec*, species of sour fruit: *averrohoa acidia*; long-leaved  
*cicci* (*C. disticha*); and *phyllanthus cheramela*.  
*Hur,ra*, an astringent nut, (*terminalia citrina*).  
*Hur,sin,gar*, the weeping nyctanthes.  
*Hus,a*, gravel, little stones.  
*Huwam*, [*plural*,] reptiles, insects, serpents.  
*Huz,a,ra*, a double-flower; a divided stream or jet d'eau (like that  
of a watering-pot).

## I.

- Ij,a,rah*, hire, rent, farm, privilege, or income of variable amount  
sold or let for a fixed sum, a farm.  
*Ijas,shamee*, a damson, a Syrian or Damascus plum.  
*Ikleel,ool,jubul*, an herb smelling like frankincense, rosemary.  
*Ik,leel,ool,mul,ik*: or honey-lotus, a sort of trefoil (*Melilotus*  
*indicus*).

- Il,a,chee, large cardamums. Ilac,chee, small cardamums.  
 Im,lee, a tamarind tree, the fruit of the tamarind (*tamarindus indica*).  
 In,dra,yun, colocynth, wild gourd (*cucumis colocynthis*).  
 In,dur,jow, seed of sparrow's tongue (*nerium antidysentericum*).  
 In,ub, a grape. Inub-oos-salub, common nightshade.  
 Ip,ar, thyme, wild marjoram (*thymus*).  
 Ishq,pencha, the wing-leaved ipomœa (*I. quamoclit*).  
 American jasmine.  
 Is,pughol, seed of the fleawort plantain (*plantago psyllium*).  
 Is,tumbh, the trunk of a tree, a column, pile, post, pillar.  
 I,yam, days, times, seasons. I,yam,i,dirou, harvest-time.

## J.

- Jae,phul, or Jatee,phul, nutmeg [*myristica moschata*].  
 Jac,put,ree, mace.  
 Ja,fur,cee, a flax flower (*Linum trigynum*) ; lattice-work.  
 Ja,hee, or Jatee, the Catalonian jasmine (*jasminum grandiflorum*).  
 Jam, the rose apple.  
 Ja,mun, the fruit and tree of the clove-leaved calyptanthus (*C. caryophyllifolia*).  
 Jant, a wooden trough for raising water.  
 Ja,rul, a species of timber tree (*lagerstrœmia reginæ*).  
 Ja,wutree, mace.  
 Jet,hec,mudh, liquorice (*glycirrhiza glabra*).  
 Jha,bur, marshy land.  
 Jhan,jha, name of an insect, caterpillar, cabbage-worm.  
 Jhan,kur, or Jhar, bushes, brambles, underwood. *Jhar,jhunkhar*, brambles, large dry bushes. Jhar,jhoor, thicket.  
 Jha,oo or Jhouwa, a species of tamarisk tree (*tamarix indica*).  
 Jharee, a forest, a wood, underwood, brushwood.  
 Jheel, a lake.  
 Jhee,see or Jhoosa, a shower of drizzling rain.  
 Jhoom,ka, a bunch of flowers or fruit, the common passion flower, (*passiflora cœrulea*.)

- Jhoo,na**, a ripe cocoanut.  
**Jhoon,dee**, a bush, a clump of grass.  
**Jhoon,thur**, ground that produces two crops yearly.  
**Joor**, a bush, bramble. **Jhul,ar**, a thicket, a copse, underwood.  
**Jhum,jhum**, or **Jhum,a,jhum**, heavy and continued rain.  
**Jhun,kha,ra**, a tree without leaves.  
**Jhur,ber**, **Jhur,bel**, or **Jhur,ber,ec**, a wild blunt-leaved zizyphus or *Ber* tree (zizy-phus jujuba).  
**Jhur,na**, to fall off (as fruit, leaves, &c. from a tree).  
**Jhur,o,ta**, the end of the season (of fruit, &c.), going out of season.  
**Jism,i,nubatee**, vegetable body.  
**Jo,ar**, the name of a grain, Indian millet (*sorghum vulgare*).  
**Joo,hee**, the auriculated jasmine (*jasminum auriculatum*).  
**Jool,nar**, the barren pomegranate tree.  
**Joon,har**, or **Joonjree**, a kind of grain (comprising many species, including Indian and Guinea corn).  
**Joo,ta,ee**, arable, tillage. **Jo,tar**, a ploughman, a husbandman.  
**Joť,na**, to yoke, to plough, to till.  
**Jou**, barley.  
**Jound,ree**, or **Joun,dee**, a species of sorghum (joar,) or soft grass (holcus).  
**Jouz**, a nut, nutmeg.  
**Jub,bar**, a tall palm tree.  
**Jud,war**, zedoary turmeric (*curcuma zerumbet*).  
**Jul**, water. **Jul,thul**, marshy ground.  
**Jul,neem**, the name of an aquatic drug plant (*herpestis monniera*).  
**Jul,pa,ee**, the saw-leaved elæocarpus (*E. serratus*) ; an olive.  
**Jum,a,lee**, a kind of musk-melon.  
**Jumal,gota**, angular-leaved physic nut (*jatropha curcas*). Purging croton (*C. tiglium*).  
**Jum,bhee,ree**, a fruit of the lime kind.  
**Jum,na**, to germinate.  
**Jun,dra**, a pitch-fork.  
**Jun,ewa**, a species of bent grass (*agrostis linearis*) ; *Doob*.

Junglee,piyaz, squills (*erythronium indicum*).  
 Junglee,sing,hara, hermodactyl.  
 Jun,gul, a forest, a wood, weeds.  
 Jun,ti,ya,na, the herb gentian.  
 Jur, a root.—Jur,ad, a locust.  
 Jur,ee,bootee, medicinal herbs, drugs.  
 Jur,hun, rice cropped at the end of the rainy season.  
 Jur,wut, the trunk of a tree.  
 Jut,a, the cockscomb flower (*celosia cristata*).  
 Jut,ma,see, or Jut,a,ma,see, spikenard (*valeriana jatamansi*).  
 Juwa, a China rose (*hibiscus rosa-sinensis*), a clove of garlic.  
 Juwa,sa, the prickly-stem hedysarum (*H. alhagi*).  
 Juwutree, mace.  
 Jyt, or Jet, name of a plant (*æschynomene sesban*).

## K.

Ka,boo,lee, a kind of pea [from *Kabool*].  
 Kaboo,lee mittee, Armenian bole.  
 Kach,hee a gardener who cultivates, and sells potherbs.  
 Ka,duh, slime, mud, mire.  
 Ka,ee, the green scum on the surface of stagnant pools, or the green mould that sticks to walls, &c.  
 Kae,phul, an aromatic bark [*fragaria vesca*], a medicine.  
 Ka,firce-mur,ich, capsicum grossum.  
 Ka,g'huz,ee, a kind of lime [*citris acid*].  
 Ka,hoo, a garden lettuce [*lactuca sativa*].  
 Ka,kool,a, cardamums.  
 Ka,la, black, dark.  
 ———,dana, name of a purgative seed [*convolvulus nil*].  
 ———,zeera, seeds of the *nigella Indica*.  
 Kalee,mirch, black pepper.  
 ———, toolsee, basil, (*ocymum basilicum*).  
 Kam,raj, sow thistle [*sonchus*].  
 Ka,na, adjectively said of fruits, nuts, &c. whose kernels are rotten, or have no kernels.

- Kan,da**, an onion. **Kand,lee**, purslain (*portulaca*).  
**Kan,doo**, or **Kaddoo**, mud, slime.  
**Kan,gun**, a species of panic-grass [*panicum*], or its seed.  
**Kans**, or **Kas**, a kind of grass, a species of sugar-cane [*saccharum spontaneum*].  
**Ka,nun**, a forest, desert, wood.  
**Kasir,ool,hujar**, saxifrage.  
**Kas,nee**, endive [*cichorium endivia*].  
**Kee,kur**, the acacia tree.  
**Kee,ra**, or **Keet**, a worm, an insect, a reptile, a snake, a leech.  
**Kel,a**, a plantain, banana.  
**Kench,wa**, an earth-worm.  
**Keo,ra**, or **Ketuk,ee**, the green-spined screw-pine (*pandanus odoratissimus*).  
**Ker,a**, a sapling.  
**Kes,ur**, saffron [*crocus sativus*].  
**Kewanch**, cowitch [*dolichos pruriens*].  
**Khad**, or **Khao**, dung, manure.  
**Kha,ee**, a ditch, trench.  
**Khanch**, slime, mud.  
**Khar**, a thorn, spine, thistle, bramble.  
**Khee,ra**, cucumber [*cucumis utilisissimus*].  
**Khet**, a field. **Khil,ab**, mire, clay, filth.  
**Khil,ana**, or **Khiljana**, to blossom [a flower].  
**Khir,mun**, harvest, heap or stock of unthrashed corn; a barn.  
**Khir,nee**, name of a fruit and tree [*mimusops kanki*].  
**Khisht**, a brick or tile. **Khrist,puz**, a brickmaker.  
**Khit,mee**, mallows.  
**Khiya,ban**, a parterre, a flower-bed.  
**Khiyaryn**, cucumbers [of two species].  
**Khiyar,chumber**, a species of cassia [*C. fistula*].  
**Khiz,an**, autumn, the falling of leaves.  
**Khoa**, pounded bricks or coarse brick-dust.  
**Khod,na**, to dig, to delve, to hollow.  
**Khol,in,jun**, or **Khoo,lin,jan**, galingal.  
**Khool,na**, to open, to be dispersed [clouds], to clear up [the sky]

*Khoont*, a corner, an angle.

*Khoor*,fa, that which is plucked from a tree, autumnal fruit ;  
purslain.

*Khoor*,ma, a date [the fruit of the phœnix dactylifera].

*Khoor*,pee, a scraper, a weeding knife.

*Khoosh*,bo, fragrant, fragrance, odour.

*Khoos*,yut,oos,salub, satyrion, salep.

*Kho*,sa, rind, peel, skin, shell.

*Kho*,sha, an ear of corn, a cluster, a bunch [of grapes, &c.]

*Khud*,ee, a grass that grows in ponds.

*Khuj*,oor, a date, or date tree [phœnix dactylifera] ; wild date  
[elate silvestris or phœnix sylvestris].

*Khim*,ba, a post.

*Khum*,an, the elder tree.

*Khun*,duk, a ditch, copse, moat.

*Khun*,gur, or Kunkur, semi-vitrified bricks, also limestone, gravel.

*Khun*,kul,ee, the name of a plant [polypody], a kind of moss.

*Khun*,tee, a paddle for digging the ground.

*Khup*,ra, a tile. *Khup*,ryl, a tiled house, or small tile.

*Khur*, dried grass, straw.

*Khur*,a,teen, an earth-worm.

*Khur*,boo,za, a musk-melon (cucumis melo).

*Khur*,dul, mustard-seed.

*Khur*-ee,mittec, chalk.

*Khur*,uk, a cow-house, or cow-shed.

*Khur*,zuh,ra, rhododaphne, or rose bay [nerium oleander].

*Khus*, the name of a grass, of the root of which *tattees* are made,  
a weed [andropogon muricatum] ; *Khus*,posh, covered with  
thorns.

*Khush*,*khush*, poppy-seed, a poppy.

*Khush*,ub, wood, timber.

*Khut*,geer or *Khut*,mul, a bug.

*Khut*,ta, acid, sour. *Khut*,ta,sag, the herb sorrel.

*Khuweed*, a green field, a sown field, green grass cut for cattle,  
green corn.

*Khuyaree*, a kind of violet.

- Khuz,an**, the autumn.  
**Khy,ra**, or **Khy,roo**, a species of the mimosa tree (mimosa catechu).  
**Kitch,pich**, mud, mire, &c.  
**Kir,ao**, a small pea (pisum arvense).  
**Kir,a,ya**, hire, faré, rent.  
**Kirfuh**, cassia lignea.  
**Kirm**, a worm. **Kirmi,peela**, the silkworm.  
**Kirumi,shubtab**, a glowworm, firefly.  
**Kirmuk**, a firefly, a small worm.  
**Kir,ou**, endive.  
**Kis,an**, or **Kreeshun**, a husbandman, ploughman.  
**Kis,a,ree**, chickling vetch lathyrus [L. sativus].  
**Kish,neez**, coriander seed [coriandrum sativum].  
**Kisht**, a sown field.  
**Kis,nuec**, husbandry, agriculture.  
**Kiwanch**, a species of cowitch [dolichos pruriens].  
**Ko,bee**, a cabbage.  
**Kod,gur**, a digger,  
**Ko,do**, a small grain, punctured paspalum [paspalum scrobiculatum].  
**Ko,ee**, the Egyptian lotus or water lily [Nymphaea lotus]: the pulp of the jack fruit.  
**Koe,ree**, a planter, a husbandman, a gardener; name of a Hindoo caste whose profession is husbandry.  
**Koh**, a mountain, hill, hillock.  
**Ko,hee**, mountainous, hilly, mountaineer.  
**Ko,ka**, a kind of lotus.  
**Koknar**, poppy. **Khus,khus**, the poppy head.  
**Kon** or **Ko,na**, corner, side.  
**Kond,ha**, a pumpkin gourd [cucurbita pepo].  
**Kon,pul**, a young shoot, a bud, an unblown flower.  
**Koo,a**, a well, slice, division [of the jack fruit].  
**Koo,an**, or **Koo,ar**, a well.  
**Kooch,iya**, a small tamarind.  
**Kooch,la**, a vomit poison nut [strychnos nux vomica].  
**Koodal**, **Kooda,lee**, or **Koodar**, a hoe, spade, pickaxe, or mattock.

- Koo,ha,sa*, *Ko,hnr*, *Kooh,ra*, or *Kooh,ra*, a fog, a mist.  
*Koo,koor,moota*, a mushroom, a toadstool.  
*Kook,ree*, a bundle of thread; maize, Indian corn [*zea mais*].  
*Kookron,da*, name of a plant [*celsia*].  
*Koo,lee*, a labourer, porter [*coolee*].  
*Koo,lee,jun*, the name of a drug [the root of piper betel].  
*Kool,ha,ree*, an axe. *Koo,lookh*, a clod of a earth.  
*Kool,thee*, name of a grain, [*dolichos biflorus*].  
*Koo,luu,jun*, seed of small fennel-flower (*nigella sativa*).  
*Koombh*, a water-pot; the sign Aquarius.  
*Koomh,lana*, or *Koom,lana*, to wither, fade, blast, droop, blight.  
*Koom,koom*, or *Koossoom*, saffron.  
*Koo,mood*, the white esculent lotus or water-lily [*nymphæa esculenta*]; the red lotus.  
*Koond*, a species of jasmine [*jasminum grandiflorum*].  
*Koonj*, an arbour, a corner, a confined place, a grove.  
*Koon,jid*, sesame seed.  
*Koo,ra*, sweepings, dirt, rubbish.  
*Koor,a*, any thing spherical.  
*Koor,thee*, a kind of vetch [*dolichos biflorus*].  
*Koosh,a*, the sacred grass of the Hindoos [*poa cynosuroides*].  
*Koot*, *costus arabicus*, a medicine.  
*Koo,taya*, a species of nightshade [*solanum jacquini*].  
*Koo,za*, a kind of rose.  
*Kor,na*, to dig out, to scoop.  
*Kos,lec*, new leaves just sprouting out.  
*Koth,meer*, *Kot,meer*, coriander, a kind of greens.  
*Koun,dha*, lightning.  
*Koun,la*, a kind of orange.  
*Kow,wa*, *Kag*, or *Kak*, a crow.  
*Kow,wa,thenthe*, or *Ko,yul*, name of a flower [*clitoria ternatea*].  
*Koost*, *costus* :—see *Koot*.  
*Krisn,churun*, name of a plant [*poinciana pulcherrima*].  
*Kub,a,ba*, or *Kubab,chee,nee*, cubebs [*piper cubeba*].  
*Kub,eel*, species, kind, family, tribe.  
*Kucha,loo*, or *Kuch,choo*, an esculent plant (*arum colocasia*).



- Kuch, ya, a reaping-hook, or sickle  
 Kuch, kel, a, a plantain, which is eaten boiled as a vegetable.  
 Kuch, nar, or Kuch, oo, ar, a tree, the flowers of which are eaten  
 as a vegetable [*bauhinia variegata*], the mountain ebony.  
 Kuch, oor, a species of turmeric [*curcuma reclinata* or *zerumbet*].  
 Kuch, ra, an unripe melon.  
 Kuch, ree, the Madras cucumber [*cucumis maderaspatanus*].  
 Kud, doo, a pumpkin or pompion [*cucurbita lagenaria*], bottle  
 gourd.  
 Kud, doo, kush, an instrument for cutting and clearing pump-  
 kins, &c.  
 Kud, ee, ma, or Kum, rha the sweet pumpkin, or pumpkin gourd  
 [*cucurbita pepo*].  
 Kud, um, a tree, the *nauclea orientalis*.  
 Kuh, wa, coffee.  
 Kuk, ree, a kind of cucumber [*cucumis utilissimus*].  
 Kuk, ron, da, a fruit [*celsia*].  
 Kul, aee, a kind of pulse ; leguminous seeds in general ; the wrist.  
 Kul, ee, a bud, an unblown flower blossom, quicklime.  
 Kul, ga, the name of a flower, cockscomb [*amaranthus*], prince's  
 feather.  
 Kul, la, a cabbage.  
 Kul, lur, barren, sterile [land], salt [as food].  
 Kul, mee, an esculent vegetable, *convolvulus reptans*.  
 Kul, oun, jec, a seed used medicinally [*negella indica*].  
 Kul, see or Kul, us, a water-pot.  
 Kul, um [*Qulum*], a reed, cuttings of trees, &c. for planting.  
 ———, kurna, to cut, prune.  
 ———, lug, ana, to plant slips or cuttings.  
 Kul, yan, a leguminous shrub, hairy glycine [*G. debilis*].  
 Kum, chee [*Qulm, chee*], a bamboo twig.  
 Kum, moon, or Kum, oon, cummin seed.  
 Kum, od, in, ee, a species of water-lily [*menyanthes Indica*, or  
*cristata*].  
 Kum, rukh, or Kum, runy, a, the fruit of the carambola tree [*averrhoa*  
*carambola*].

- Kum,ul, the Indian sacred bean [*nelumbium speciosum*], also Indian lotus or water-lily [*nymphæa nelumbo*].
- Kum,ul,a, name of a caterpillar or larva of a brown moth destructive to trees : the palmer worm.
- Kun,koot, appraisement of a crop on the field valuation.
- Kuna,kuchoo, the name of a vegetable.
- Kun,ar, side, brink. Kun,a,ruh, beach, shore, margin, edge.
- Kund, a bulbous esculent root [*arum companulatum*], garlic.
- Kunda, or Kund,ra, a squill [*erythronium indicum*].
- Kun,dur,ee, name of a vegetable ; a kind of mustard.
- Kun,dus, sneezewort milfoil [*achillea ptarmica*].
- Kun,er, a species of oleander [*nerium odorum*].
- Kung,nec, a small grain [*panicum italicum*].
- Kunk,rol, a kind of gourd [*momordica mixta*].
- Kun,kur, gravel, limestone.
- Kunt,kar,ee, a species of prickly night shade [*solanum jacquini*].
- Kun,khuj,oor or Go,jur, a centipede.
- Kun,uk, the plant *dhutoora* or thorn apple [*datura metel*].
- Kunj, a lotus. Kun,wul, the lotus [*Nymphæa nelumbo*].
- Kup,as, cotton [undressed] ; the cotton plant [*gossypium herbaceum*].
- Kup,oor, camphor ; also, the name of a flower.
- Kup,oo,ree, a kind of betel leaf so called.
- Kur, the seed of safflower [*carthamus tinctorius*].
- Kur,ant, or kur,at, a saw. Kur,an,tee, a sawyer.
- Kur,bee, the stalk of joar or bajra [*holcus sorgum* and *spicatus*].
- Kur,eel, the common caper-tree [*capparis spinosa*].
- Kur,ela, a vegetable [*momordica charantia*].
- Kur,moosh, a musk rat.
- Kur,na, a species of citron [*citrus medicus*].
- Kur,oh, or Kos, a land measure nearly equal to 2 miles, but in every part of India.
- Kur,on,da, name of a fruit, the corinda [*carissa carandas*].
- Kur,oo,ya, carraway seed.
- Kur,ufs, parsley.

- Kur,umb, or Kur,um,kulla, a cabbage.  
 Kur,un,phool, a clove, the clove July flower [amiris heptaphylla].  
 Kur,ur,boon, name of a plant.  
 Kurwee, stubble of a sort of grain.  
 Kur,weer, a fragrant plant or flower [oleander, or nerium odorum].  
 Kuryt, a snake [of a very venomous kind].  
 Kus,ela, adj. astringent. Kus,ao, astringency.  
 Kus,eroo, a root so called [cyperus tuberosus].  
 Kus,oun,dce, the round podded cassia [cassia sophora].  
 Kut,an, or Teesee, linseed.  
 Kut,a,ra, a kind of sugar-cane.  
 Kut,a,ra, a medicinal species of the globe thistle [echinops echinatus].  
 Kut,ee,la, name of a plant; adj. thorny.  
 Kut,ee,ra, a gum, resembling tragacanth, obtained from the sterculia urens.  
 Kuth,bela, a species of jasmine [jasminum multiflorum].  
 —,goolab a species of rose [rosa chinensis].  
 Kut,hul, the jack tree and fruit [artocarpus integrifolia].  
 Kut,kur,unj, or Kut,kul,ejee, the febrifuge nut [guilandina bonducella or cæsalpinia bonducella].  
 Kut,nee, the season for cutting grain, harvest.  
 Kut,ol, name of a plant [perhaps cowitch,—dolichos pruriens].  
 Kut,tha, a measure of land [the 20th part of a beegha]. A corn measure containing 5 seers.  
 Kut,tul, a lump of stone, brick, or earth; shard.  
 Kyn,chee or Kut,ur,nee, scissors.  
 Ky,rec, a small unripe mangoe.  
 Ky,soom, southernmost, or southernwood, wormwood [artemisia abrotanum].  
 Kyt or Ky;tha, the Indian elephant apple tree [feronia elephantum].

## L.

- La,dun, ladanum, a resinous substance exuding from the leaves and branches of the cretan rock-rose [cistus creticus].

La,hee, name of a plant.

Lal,sag, orache, or mountain spinach. Oval-piked amaranth (*amarantus gangeticus*).

— kud,doo, a species of pompion.

La,luh, a tulip.

Lalu,sitan, a bed or garden of tulips.

Lee,chee, the lee-chee tree or fruit (litchi dimocarpus).

Leed, the dung of horses, elephants, or other animals.

Leel indigo—adj. blue. Vide “neel.”

Lee,moo, or Leeboo, a lime, lemon, citron-fruit or tree, (*citrus medica*): also a general name for the fruit or trees of the orange tribe: Kouzla—Kaula—Narunj—Narungee—Rungtura—Sungtura, being *adjective* terms to the *substantive* Leemoo, as so many species of the common orange fruit. Shurbutee Lemoo—Suda Leemoo—Kaghuzee Leemoo—Jambheerce Leemoo, 4 kinds of Lime. Shurbutee Leemoo, a lime from which a sherbut is made. Butavee Leemoo (corruption of Batavia), the pumple-moose, or shaddock.

Lee,nuh, a kind of palm.

Lis,an,oos,sour, a species of bugloss (*anchusa*). A species of borage (*borago*).

— ool,humul, plantain.

— oolusafer, the seed of the ash tree.

— ool,kulb, the herb dog's-tongue (*cynoglossum*).

Lis,o,ra, the fruit of the smooth-leaved cordia (*cordia myxa*).

Lobiya, the Chinese dolichos or bean (*dolichos sinensis*).

Lodh, the bark of a tree (*symplocos racemosa*), used in dying and medicine.

Lokat, the loquat or Japan medlar (*eriobotrya japonica*).

Lo,na, or Nona, salt, brackish; barren or salt (land). Small purslain (*portulaca oleracea*); the salt that effloresces from walls, &c: the netted custard-apple (*annona reticulata*).

Long, or Loung, a clove.

Loo, or Looch, a hot wind.

Looch,ra, a spider.

Lota,sujjee, a kind of earth, containing fossil alkali.

- Lot,poo,tiya, water-cresses (*sisymbrium nasturtium*) ?  
 Lou,ka, the bottle-gourd (*cucurbita lagenaria*), lightning.  
 Lou,kee, a kind of pompion.  
 Louz, an almond.  
 Lub,er,a, or Lus,o,ra, the fruit of the smooth-leaved cordia (*cordia myxa*). Bura lus,o,ra; the broad-leaved cordia (*cordia latifolia*).  
 Lu,hoo,a, a plant. Luh,sun, garlic.  
 Luhur,a, a species of soft-grass (*holcus spicatus*). see "Bajra."  
 Lu,ja,loo, or Luj,wun,tee, a kind of sensitive plant: the humble plant mimosa (*mimosa pudica*), or spreading mimosa (*mimosa natans*).  
 Luk,ree, wood.  
 Lup,ta, a kind of molasses, a species of panic grass (*panicum verticillatum*).  
 Lurha, a cart: Lurhee, a small cart.  
 Lut,a, a creeper, a vine.  
 Lut,kun, the anata with which clothes are dyed.  
 Lutree, a kind of vetch.

## M.

- Ma,husul, any thing collected; the harvest; produce of fruit trees, &c.  
 Ma,chan, a platform.  
 Ma,chee, a harrow; a small bedstead.  
 Mah,ta,bee, a sort of musk-melon.  
 Ma,joo,phul, a gall-nut.  
 Ma,lee, a gardener: Malin, a gardener's wife, a female gardener.  
 Mal,kung,nee, a species of staff-tree (*celastrus*).  
 Ma,lut,ee, the clove-leaved echites (*echites caryophyllata*). Catalanian jasmine (*jasminum grandiflorum*): a species of banisteria (*banisteria bengalensis*).  
 Man,jha, the trunk of a tree.  
 Mar,cho,ba, asparagus.  
 Mash, the hairy-podded kidney-bean (*phaseolus max*), or rayed kidney-bean (*phaseolus radiatus*).

- Mar,tal**, a hammer.  
**Ma,tee**, Muttee, or Mittee, earth.  
**Ma,zoo**, the oak-apple or gall-apple  
**Mee,joo**, lentil.  
**Megh**, a fragrant grass, a species of cyperus (*cyperus rotundus*).  
**Megh**, a cloud, mist, fog.  
**Mend**, a bank (raised to separate fields), a border.  
**Menh,dec** or mihdee, the henna-plant lawsonia (*Lawsonia inermis*) from the leaves of which a reddish dye is prepared, and used by some of the natives of India to stain the palms of their hands, the soles of their feet, &c.  
**Merh,shrin,gee**, a species of swallow-wort (*asclepias geminata*), a milky plant, the fruit of which is crooked, and therefore compared to a ram's horn.  
**Met,hee**, common fenugreek (*trigonella fœnumgræcum*).  
**Met,oo,la**, a species of hog-plum tree (*spondias magnifera*).  
**Me,wuh**, fruit. **Me,wuh,dar**; bearing fruit, fruitful.  
**Miqraz**, scissors, shears. **Minshar**, a saw, hand saw.  
**Mir,aj**, a ladder, stair, mist.  
**Mirch**, or **Mircha**, pepper. **Gol,mirch**, black-pepper. **Lal,mirch**, capsicum frutescens.  
**Mish,mish**, an apricot.  
**Mo,cha**, a plantain tree (*musa sapientum*).  
**Moch,rus**, gum of the semul, or seven-leaved silk-cotton tree.  
**Mog,ra**, the great-double arabian or tuscan jasmine (*jasminum*).  
**Mooghce,lan**, the acacia tree.  
**Moo,hou,wut,uh**, an enclosure; a wall, &c. forming an enclosure.  
**Mooh,ree** or **Mouhree**, a drain, gutter.  
**Moo,khud,dir**, adj. narcotic.  
**Moogl**, Bdelium. **Moo,lee**, a radish.  
**Mool,hut,tee**, a medical root, liquorice (*glycyrrhiza glabra*).  
**Mool,ta,nee**, Armenian bole (literally earth of mooltan).  
**Moon,dec**, the Indian sphæranthus (*Sph. indicus*).  
**Moong**, the small fruited kidney bean (*phaseolus mungo*).

Moong,phulee, the earth-nut or pig-nut of the W. Indies (*arachis hypogæa*).

Moonj, a grass of which rope is made (*sacharum munja*).

Moo,nuk,ka, a species of raisin.

Moord, or Wulaṭṭee-mendee, myrtle.

Moo,shuj,jur, adj. abounding in trees.

Moos,la, a taproot; the fusiform receptacle of a many-seeded fruit (as of the *artocarpus*, *annona*, &c.).

Moos,mir, adj. fruitful, fruit-bearing.

Moosum,mur, fruit ripe for gathering.

Moos,ra, a rat. Moosree or Moosh, a mouse.

Moo,sub,bur, aloes.

Moo,us,fur, safflower (*carthamus tinctorius*).

Mot,ha, a grass the root of which is medicinal (*cyperus rotunda*).

Mo,tiya, name of a flower (*jasminum sambac*).

Mot,kee, a mattock, a pickaxe.

Moul,sur,ee, name of a tree (*mimusops elengi*).

Mour, the blossoms of a tree, especially of the mango.

Mou,sim, or Moodhoo, blossoming season, or time.

Mouz, a plantain.

Mud,ar, or Mun,dar, curled flowered swallow-wort (*asclepias gigantea*).

Mudun, a medicinal plant—dhutoora; the plant *mynphul* (*gardenia dumetorum*: or *vangueria spinosa*).

Mugh,rib, the west, sunset.

Mug,rel,a, Indian fennel flower (*nigella indica*).

Mug,us, a kind of Indian corn.

Muh,keel,a: adj. odoriferous, spicy, aromatic.

Muhoo,a, the broad-leaved bussia (*B. latifolia*). Gil,ounda, the flower, after it has fallen off.

Muj, ripe, mellow.

—,eeth, or Mun,jeet, Madder (*rubia tinctorum*, or *munjista* of Rox:).

Muk,o, a species of *solanum nigrum*.

—,oe, sarsaparilla (*smilax*?).

Mul, an herb.

- Mul,ukh, a locust. Muluki,khoord, a grasshopper.  
 Mumbu, or Mundut, a fountain, jet d'eau, spring, source.  
 Mundooa, an alcove, an harbour.  
 Mun, manna. Mun,jur, the blossom (of a tree).  
 Munr,wa, a grain, on the coast called ragee, (eleusine coracanus).  
 Murg,h,zar, a place abounding in verdure or in pasture, a verdant meadow.  
 Muroo,a, a species of wormwood (*artemisia vulgaris*: or *ocymun pilosun*).  
 Mur,or,phul,ee, East Indian screw-plant [*helictires isora*], the fruit of which is used in medicine.  
 Mur,sa, the name of a pot-herb [*amarantus oleraceus*].  
 Mus,een, a vetch, pulse.—Mush,jur, a grove.  
 Mus,oor, a kind of tare or chick-pea [*ervum lens* or *cicer lens*, or *ervum hirsutum*].  
 Mus,tuk,ee, mastiche [the resin of the *pistacea lentiscus*].  
 Mutiyara, arable land, rich soil.  
 Mut,na, a species of sugar-cane.  
 Mut,ra, or Mut,ree, species of pea.  
 Mut,ur, the common pea [*pisum sativum*].  
 Muweez, a raisin.  
 Muyee, a harrow, a ladder.  
 Muzdoor or Muz,oor, a labourer.  
 Muz,ruh, a field sown, or prepared for sowing.  
 My,dan, a plain, an open field.  
 Myn,phul, a fruit used in medicine [*vauguiera spinosa*].

## N.

- Nab,dan, a gutter.—Na,da,ha or Nuddhe, a spout, a canal.  
 Nadh,na, to yoke.  
 Na,fur,man, the rocket larkspur [*delphinium ajacis*].  
 Nag,bel, betel leaf [*piper betel*].  
 —,douna, mugwort wormwood [*artemisia vulgaris*].  
 —,es,ur, or Nag,kes,ur, Indian rose chesnut [*mesua ferrea*].  
 —,phun,ee, a hedge plant [*cactus indicus*].  
 Na,gul, or Nan,gul, a plough.



- Na,gur,motha, a sweet-smelling cyprus grass [*C. pertenuis*].  
 Nami,yuh, vegetation, growth; a stem, stalk of grapes, a creature.  
 Koovut,e,nami,yuh, power of growth or of vegetating.  
 Na,na, mint [*mentha sativa*].  
 Nar, a pomegranate [*punica granatum*]. The stalk of lotus.  
 Na,ree, a kind of greens.  
 Na,riyul, } a cocoanut; the cocoanut tree [*cocos nucifera*].  
 Nar,jeel, }  
 Na,rung,ee or Na,rung, an orange [*citrus aurantium*].  
 Narunjee, adj. orange colored.  
 Nash,pa,tee, a pear [*pyrus communis*].  
 Nas,pal, the rind of an unripe pomegranate [used in dying].  
 Na,yab, scarce, rare.  
 Naz,bo, the ciliated basil [*ocimum pilosum*].  
 Naz,boo,ee, a species of sweet basil [*ocimum*].  
 Na,zook,bud,un, the blunt leaved zizyphus [*zizyphus jujuba*].  
 Neem,boo; see—"Lee,moo."  
 Neel, the East Indian indigo [*indigofera tinctoria*]: blue.  
 Nee,lo,fur, the Egyptian lotus water lily [*nymphaea lotus*], the  
 lotus nilufer.  
 Neem, or Neemb, the ash-leaved bead-tree [*melia azadirachta*].  
 Ne,wun,jee, name of a flower.  
 Ni,hal or Ni,hal,ee, a young plant, shoot, sucker.  
 Nikae, the price paid for weeding a field, the act of weeding.  
 Nir,bis,ee, zedoary turmeric [*zerumbet curcuma*], amomum zed-  
 oria, curcuma zedoria (?).  
 Nir,cha, the heart-leaved corchorus [*corchorus capsularis*].  
 Nir,mul,ee, the strychnos clearing nut [*strychnos potatorum*], with  
 which water is cleared, &c.  
 Niwa,ree, a flower, a species of jasmine.  
 Nona, the netted custard-apple [*annona reticulata*].  
 Noniya, the small purslain [*portulaca oleracea*].  
 Noo,khood, the common chick-pea [*cicer arietinum*].  
 Nou,bawuh, a young tree.  
 Nou,buhar, the commencement of spring.  
 Noud,hub, a young plant or fresh shoot, or branch of a plant.

Nub,at, vegetation ; a herb ; vegetable ; grass. Nubatat, pl. vegetables ; herbs. Ilm,i,nub,at, botany.

Nud or Nud,ee, a river.

Nug,dou,na, wormwood. See—"Na<sub>5</sub>,dou,na."

Nuk,chkik,nec, a sternutatory plant.

Nukhl, a date or palm tree [and often used for a young tree of any kind], a plant.

Nukhl,bund, a gardener, a maker of artificial wax fruit, &c.

Nukhl,bun,dee, a plantation.

Nur,gis, or Nurgis,shuhla, a narcissus.

Nur,kut, a reel of which mats are made [arundo tibialis].

Nus,ee, a coulter, plough share. Nyna, or Pug,a, a tether.

Nus,reen, a wild rose.

—,tur,un, the white rose of India [rosa glandulifera].

Nyn,sookh, a flower. Ny,shuk,ur, sugar-cane.

## O.

Ol, a species of esculent rooted arum plant [A. companulatum].

Ood, wood, timber, a staff or stick, the wood of aloes.

Oo,doom,bur, the glomerous fig tree [ficus glomerata].

Ookh, a sugar-cane [saccharum officinarum].

Oo,khar,na, }  
Ookh,ra,na, } to root up, to eradicate, to break or pluck up.

Oo,loo, }  
Ool,wa, } a species of sugar-cane [saccharum cylindricum].

Oon,nab, the jujube fruit.

Oont,kut,ara, a species of the globe thistle, of which camels are fond [echinops echinatus].

Oordh, a species of vetch [dolichos pilosus or hairy-podded dolichos].

Oo,rooz, a species of rice.

Oo,seer, a fragrant root of grass, used in making tattees [andropogon muricatum].

Oos,foor, safflower [carthamus tinctorius].

Oosh,ba, sarsaparilla.

Oosh,tur,khar, a thistle.

Oot,tur, north. Oot,tur,a : northern, northerly ; north wind.

- O,shud,hee, or O,khud,hee, an annual plant or herb.  
 Ouchh, the root of the broad leaved morinda (*M. citrifolia*).  
 Oun,la, the fruit of the shrubby phyllanthus [*phyllanthus emblica*],  
 a kind of myrobalans.  
 Ou,rak, leaves.

## P.

- Pal, layers of straw, leaves, &c. between which unripe mangoes  
 and other fruits are ripened.  
 Pa,kur, the waved citron, or vein leaved Indian fig tree (*ficus  
 venosa*).  
 Pala, the leaves of a tree named Jhur,ber,ee [a species of zizy-  
 phus]: frost, snow.  
 Pa,luk, common spinach [*spinacia oleracea*].  
 —,joohee, white flowered justicia [*J. nasuta*]. Also ixora  
 undulata.  
 Pan, a leaf, betel leaf [leaves of the piper betel].  
 Pa,nee, water. Panec,purna, to rain.  
 Pans, manure, a dung-hill. Pans,ho,ja,na, to rot, to become mellow  
 [land]. Pans,na, to manure.  
 Pantur, a desert field.  
 Pa,pa, a weevil, an insect bred in rice.  
 Pap,ra, the broad-leaved gardenia [*G. latifolia*].  
 Pa,rul, the tree trumpet-flower [*bignonia chelonoides*] or bignonia  
 suaveolens.  
 Pa,rus,peepul, the poplar-leaved hibiscus [*H. populneus*].  
 Pat, tow [flax or hemp].  
 Pat, or Patee, a leaf.  
 Pa,wus, the rainy season.  
 Pa,yeez, autumn.  
 Pa,yul, a bamboo ladder.  
 Pee,choo, the fruit of the capparis or caper tree.  
 Pee,loo, the name of a tree [*salvadora persica*]: also in the Dukhin,  
 the careya arborea.  
 Peend, a roller.  
 Peepla,mool, the root of the long-pepper tree.

Pee,pul, the holy fig tree [*ficus religiosa*]: long pepper [*piper longum*].

Pect,rus, turmeric [*curcuma*].

Per, a tree, a plant. Per,lagana, to plant trees,

Per,ee, a kind of betel leaf, the indigo plant after being once cut : the trunk of a tree.

Pet,ha, a kind of gourd [*cucurbita*].

Phal, a ploughshare, a lump of betel-nut [*Areca*].

Phan,dee, a bundle of 50 or 100 sugar-canes.

Phao,ra, a mattock, a spade, a hoe. Phao,rec, an instrument like a small rake or hoe for removing horse-dung.

Phool,ko,bec, a cauliflower. Phool,waree, a flower garden.

Phoon,gee, a sprout, a bud, the point of an ear of corn, &c.

Phoon,hara, or Fon,wa,ruh, a fountain, a jet d'eau.

Phoot, a kind of melon [*cucumis momordica*]; a ripe cucumber bursting elastically [as the *cucumis utilatissimus* and *momordica mixta*].

Phul or Phur, fruit. Phul,dar, fruitful.

Phul,ec, a pod [or the seed] of leguminous plants.

Phul,tar, the fruit bearing *tar*, the female palm.

Phun,ga, a grasshopper.

Phur,sa, an axe, a hatchet, a pickaxe or instrument for digging.

Pil,loo, or Pil,ooa, a worm, a maggot.

Pin,da,loo, a fruit [*trewia nudiflora*, or *rottlera indica*].

Pistuh, a pistachio-nut [*P. officinarum*].

Pit,papra, common fumitory [*fumaria officinalis*].

Piyal, or Cheeroojee, a fruit [*chironjia sapida*].

Piyaz, an onion [*allium cepa*].

Podee,nuh, mint [*mentha sativa*].

Poe or Poya, Malabar night-shade, white and red [*basella alba*, and *rubra*].

Pok,hur, a pond, a tank. Pool, a bridge, an embankment.

Poo,ren, the plant of the lotus.

Po,rec or Por, a joint of bamboo, sugar-cane, &c.

Poud,ha, a young tree.

Poun,da, a kind of sugar-cane.

Puḍ,um, the Indian sacred bean, or lotus (*nelumbium speciosum*).

Puha,ree,pcepul, the mountain long-pepper (*piper silvaticum*).

Pukh,ree or Punkh,ree, a petal or flower leaf.

Pul,as or Pur,as; the downy-branched butea (*B. frondosa*) on which the lac insect feeds. vide "Dhak."

Pul,luv, a sprout or shoot of a branch, a twig.

Pul,uee, a young branch or spray of a tree.

Pulwul or Purwur, a species of snake-gourd (*trichosanthes dioica*).

Pun,chuk,kee, a water-mill. Punch,hee, a bird in general.

Puniya,la, the many spined flacourtia (*F. cataphracta*).

—,na, to irrigate, to water, to yield water.

Punj,ungoosht, a species of cinquefoil (*potentilla*).

Pun,war, the blunt leaved cassia (*C. obtusifolia*).

—,waree, a betel garden.

Pupy,ya, or Pupeeta, papaw-tree, and fruit (*carica papaya*).

Pur,ag, pollen, farina (of a flower).

Pur,buṭ,iya, a kind of pumpkin.

—,chha, self-sown *paddy* (rice).

Pur,gachh, epidendrum, or parasite plant.

Purisiya,wooshan, a species of brake (*pteris lunulata*).

Pursiya, a reaping hook, a sickle. Purtee, waste ground.

Pus,hee, a species of wild rice growing in shallow ponds.

Put,ana, to irrigate, to water. Put,ao, irrigating, flooding a field.

Put,a,pur, name of a fruit. Put,era, papyrus.

Put, a leaf. Puth, a plant with long-leaves.

Put,jhur, without leaves. The fall of the leaf, autumn.

Put,ooa, tow made from the hemp-leaved hibiscus (*h. cannabinus*).

—,ra, unripe grain, common chick-pea (*cicer arietinum*).

—,sun, striated-stalked crotalaria (*crotalaria juncea*).

—,ta, a leaf. \*

—,tee, a leaf, hemp of which an intoxicating potion is made.

Putthur,choor, a plectranthus plant [*P. paromaticus*].

Putthur,chut,a, a sort of greens

Pyn, a reservoir of water, a rill. Py,nala, a gutter, a spout.

Py,wun,*dee*, engrafted.

Py,wundee,ber, an engrafted *ber* (zizy plus jujuba).

## Q.

Qir,miz, crimson: Kermes, used in dying. Qir,mizi,furungee, cochineal. Qir,mizee, scarlet, crimson.

Qishr, peel, skin, bark, husk, shell, crust, rind.

Qism, a kind, species, sort, part, share, division.

Qoolt, saxifrage. Qoor,toom, safflower.

\* \* Several words inserted under the letter "K" of this Vocabulary should properly come under the letter "Q", which, according to the orthoepical scheme adopted, more correctly conveys the sounds of their first syllables. Of these the following words are instances.—Ka,kool, a—Kir,fuh—K ʔo,lec—Kub,eel—Kuh,wa—Kul,un—Kum,chee—Kyn,chee—Ky,soom.

## R.

Rae,bel, a flower so called.

Ra,ee, Chinese mustard (*sinapis chinensis*).

Rae,munee or Rac,muniya, a kind of rice (in the husk).

Ram,sur, the name of a wood, the name of a kind of reed.

—,tool,see, the shrubby basil (*ocimum gratissimum*).

—,tooruce, the name of a vegetable, ochra (*hibiscus longifolius*).

Randa, barren; particularly applied to unproductive trees, as the male palm, &c.

Rand,nec, Parsley.

Ra,wund, rhubarb. Ra,wund,i,cheenec, chinese rhubarb.

Reet,ha, the name of a fruit, soap-wort, soap-nut, common soap-berry (*sapindus saponaria*).

Reh,la, a vetch. Ren,*dee*, a small melon.

Ren,*dee*, palma christi (*ricinus vulgaris*). Rendee,ka,tel, castor-oil.

Reng,nec, a medicinal herb.

Roece, growing, vegetating. Roece,dug,ee, vegetation, growth of a plant.

Rook,hee, a squirrel.

Room,man, a pomegranate.

- Rooth,nee, a species of sensitive plant (*mimosa natans*).  
 Rub,ee, the spring : spring harvest, or grain cut in spring.  
 Ruj, dust, the farina of flowers.  
 Rukt,pit,tee, a plant used for the cure of a cutaneous disorder of the same name.  
 Rukut,chundun, red sandal wood (*pterocarpus santalinus*).  
 Rund, the palma christi : *ricinus vulgaris*.  
 Rung,tur,a, a species of orange.  
 Rusta or Rus,tuh, a road.  
 Rut,a,loo, the common yam (*dioscorea sativa*).  
 Ru,wans, a species of bean (*dolichos sinensis*).  
 Ry,han, an odoriferous plant, sweet basil. *Tookhm,i,ryhan*, the seed of the *ocymum pilosum*.

## S.

- Saboo,danuh, sago.  
 Sadij,hindee, Indian leaf (*tezpat*).  
 Sag, greens, edible vegetables, culinary herbs.  
 Sa,goon or Saj, teak-wood or tree (*tectona grandis*).  
 Sal, or Shal, a species of large timber tree (*shorea robusta*) ; a thorn ; spine.  
 Sal,sa, sarsaparilla.  
 Salub,misree, salep (the root of a species of orchis)  
 San,wa, the grain of the *panicum frumentaceum*.  
 Sat,hee, a species of rice produced in the rains (so called because it ripens in 60 days from the time of sowing).  
 Seb or Seo, an apple (*pyrus malus*).  
 Seech,na, or Seench,na, to water, to irrigate.  
 Seej, a species of euphorbia (*E. nereifolia*) : the milky hedge plant (*E. antiquorum*).  
 Seep,hul, }  
 Shrec,phul,a, } the Bilva or Matura (*Asiatic Researches*, vol. ii. p. 349) a species of Bengal quince [*ægle marmelos*].  
 Seer, damp, husbandry, agriculture, garlic.  
 See,ra, a channel through which fields are watered : overflowing field.

Seer,hee, a ladder, stair, step.

See,ta,phul, the custard apple [*annona squamosa*]

See,tul,cheence, all spice (*pimenta vulgaris*).

Se,hoond, a species of euphorbia, and general name for plants of that genus: the milk hedge plant (*E. antiquorum*).

Sem, flat beans.

Sem,bul, the silk cotton tree (*bombax heptaphyllum*).

Sem,ul, a species of (coarse) cotton tree (*vitex trifolia*).

Send, the Madras cucumber (*C. maderaspatanus*).

Sent,ha, } a species of reed (of which morhas are made) reed  
Sent,hee, } grass (*saccharum sara*).

Seo,tee, a white rose (*rosa glandulifera*).

Shah,bulloot, a chesnut.

Shah,aloo, a cherry (*prunis cerasus*).

Shah,tur,a, the two-flowered Indian madder (*oldenlandia biflora*).

Sha,khool, a species of grain (*cytissus cajan*).

Sha,ma, species of grain (*panicum colonum* or *frumentaceum*).

The bird so called.

Shee,shum or Sissoo, a species of timber tree (*dalbergia sissoo*).

Sho,la or Sola, a species of *æschynomene* (*paludosa*): being light and spongy is used for fishing net-floats, toys of artificial birds, flowers, &c. and when charred, for tinder.

Shor,zumeen, salsuginous ground, barren land.

Shub,bo, the Egyptian violet, which yields scent at night.

Shuft,aloo, the common peach almond (*amygdalus persica*).

Shub,toot, a mulberry.——Shuk,aik, a tulip.

Shuk,ur, or Shuk, sugar.

Shuk,ur,ee, the asiatic grewia (*grewia Asiatica*).

Shuk,ur,kund, the sweet potatoe or tuberous bind-weed (*convolvulus batatus*).

Shul,gkum, a turnip (*brassica raka*).

Shum,i,yana, a canopy, an awning.

Shum,shad, the box-tree.

Shur,ee,fa, the custard apple (*annona squamosa*).

Sil,ec, a flat stone.

Sim,sim, the grain sesame.



- Sin,gar,har, the weeping night-flower (*Nyctanthes arbor-tristis*).  
 Sing,ha,ra, a species of water-caltrops (*trapa bispinosa* or *natans*).  
 Sir,is, a species of mimosa tree (*M. sirissa*).  
 Siwar,green vegetation at the bottom of stagnant water [*valisneria spiralis*].  
 So,a, fennel (*anethum sowa*, or *graveoleus*).  
 Som,raj, black cummin seed (*serratula anthelmentica*).  
 Son, Indian trumpet flower (*bignonia indica*).  
 Sona,mookhee, cassia senna.  
 Soo,gundh, fragrant.  
 Soohur,na, to trail.—Sook,ha, dry.  
 Sookh,dur,sun, a species of crinum (*C. asiaticum*).  
 Soom,bool, hyacinth.—Soo,mun, a flower in general.  
 Soon,da, a weevil.  
 Soonj, the red jujube or bair (ber) tree.  
 Soontna, to strip the leaves.  
 Soop,aree, betel nut (*areca catechu*).  
 Sooruj,mookhee, a sun-flower (*helianthus annuus*).  
 Soo,run, arum *campanulatum*.  
 Soos, liquorice.—Soot, a stamin, tendril.  
 Sooth,nce or Soosni,aloo, a species of yam (*dioscorea fasciculata*).  
 So,sun, a lily.—Sot or Sota, a spring, fountain, jet d'eau, &c.  
 Souuf, anise (*pimpinella anasum*).  
 Sub,ir, a species of aloe.  
 Subza or Subzee, (mas. and fem.) herbage, greens.  
 Sud,a,soohagun, the purple flowered hibiscus (*h. phœniceus*).  
 Sufree,am, a guava (*psidium pyrifera*).  
 Suf,ur,jul, a quince.  
 Suhuj,na, the horse-radish tree (*hyperanthera moranga*).  
 Suk,moonjiya, the scammony bind-weed (*convolvulus scammonia*).  
 Sum,aloo, the chaste tree (*vitex trifolia*).  
 Sum,ee, mimosa albi.  
 Sun, striated-stalked (*crotalaria C. juncea*).  
 Sun,bul, valerian plant (*valeriana jatamansi*).  
 Sun,oubur, the fir, pine, or any cone-bearing tree.  
 Sur,awun, a harrow.

Sup,ed,ar, the white poplar.

Sur,kura, or Surpul, a reed (*saccharum procerum*).

Sur,muk, orache (*artiplex*).

Sur,oj, the lotus.

Sur,son, a species of mustard (*sinapis dichotoma*).

Shur,shuf mustard seed.

Sur,uk, a road.— Sur,a, a tree from which bows are made.

Sur,ul, the long leaved pine (*Pinus longifolia*). adj. perpendicular.

Sur,un,jam, materials, utensils.

Surv, the cypress tree. Survi,ruwan, a moving cypress.

Suz,ab, water cresses.

## T.

Tag,h, a poplar, an elm, a tamarisk, a pomegranate.

Taj,khur,os, the cock'scomb flower [*amaranthus* or *celosia*] literally—cock's comb.

Tak, a vine; grapes.

Tal or Tar, the fan leaved borassus [*B. flabelliformis*].

Ta,lab or Ta,lao, a pond, reservoir of water, a tank.

Tal,mukhana, the long-leaved barleria [*B. longifolia*].

Tee,see, common flax [*linum usitatissimum*].

Teet,ree, a butterfly. Tec,tur, a partridge.

Tej,pat or Tcz,pat, the leaf of the bastard-cinnamon—or tall laurel [*Laurus cassia*, or *malabattrum*] or the tree itself.

Ten,doo, the fruit of the smooth date plum [*diospyros ebenum*].

Tent, ripe fruit [or Ten,ta, large ripe fruit] of the “kureel” or common caper tree.

Ter,a, the trunk of a tree.

Tes,oo, the blossoms of the pul,as, or downy-branch butea.

Tez,uk, cress, cresses [*lepidium sativum*]

Tha,la, the place at the root of a tree for holding water; the excavation in which the tree is to be planted. T'ha,la, a branch.

Tha,lee, a mound about the root of a tree.

Thili,ya, a water pot.

Thoo,hur, a species of spurge plant [*euphorbia neriifolia*].

Thut,hera, the stalk of the joar [*holcus sorgum*].

**Tib**, medicine. **Tib**,bee, medicinal.

**Tid**,da, a grasshopper. **Tid**,dee, a locust.

**Tid**,para, the spreading triangular spurge [euphorbia antiquorum]

**Tikhra**,kurna, to trifallow, to plough three times.

**Tik**,tik,ee, a lizard.

**Til**, the seed of the oriental oily-grain [sesamum orientale].

**Tin**,tir,ee, the tamarind.

**Tod**,ree, the seed of mallows.

**Tok**,ra, a large basket. **Tok**,ree, a small basket.

**Too**k<sup>h</sup>mi,balunga, a seed of a cooling quality.

———, kahoo, seed of lettuce [lactuca sativa].

———, kut<sup>h</sup>,an, linseed.

———, ryhun, the seed of the ciliated basil [ocimum pilosum].

**Toolee**,doon, fox grape, night-shade [solanum nigrum].

**Tool**,see, species of basil [ocimum villosum or sanctum], worshipped by many of the Hindoos.

**Toon**, the Indian bastard-cedar [cedrela toona].

**Toorb**, a radish. **Toor**,shuh, wild sorrel.

**Toor**,bud, a purgative bind-weed root : Turbith [convolvulus turpethum.]

**Toor**,fa, the tamarisk tree . called also Jha<sup>h</sup>,oo.

**Too**,ruce, a species of cucumber [cucumis acutangulus]

**Too**,runj, the citron orange [citrus medica].

**Toot**, the Indian mulberry [morus Indica].

**Too**,ur, the pigeon-pea cytissus [C. cajan].

**Tora**, a bank, island, bar, a ploughshare.

**To**,ree, mustard seed : **Tor**,ta, a dried **Toree**-pod, kept for seed.

**Trin**, grass. **Tuk<sup>h</sup>**,danuh, darnel, tares.

**Tuh**,na, or **Tuh**,nee, [mas. & fem.] a branch or large bough of a tree.

**Tuj**, the bastard cinnamon laurel tree or its bark [laurus cassia]

**Tuk<sup>h</sup>**,tuh, a plank, board ; a bed of flowers, &c.

**Tul**,ao, a tank, reservoir. **Tuty**,ya, a small pond.

**Tum**,akoo, or **Tum**,ba,koo, tobacco.

**Tum**,al, the painter's xanthochymus [X pictorum]

**Tum**,bol, the betel leaf.

*Tumr*, a date. *Tumr*, *hindce*, or *Turm*, *ur*, *hind*, a tamarind [*tamarindus indicum*].

*Tun*, *uh*, a stalk, stock, trunk of a tree, stem.

*Tur*, *booz*, the water-melon gourd [*eucurbita citrullus*].

*Tur*, *karee*, esculent vegetables. *Tur*, *uh*, garden-herbs.

*Tur*, *uh*, *tez*, common cress pepperwort (*lepidum sativum*).

*Tur*, *uv*, a tree. *Tur*, *wur*, any large tree.

## U.

*Ub*, *bas*, common marvel of Peru (*mirabilis jalapa*).

*Ub*, *juh*, water lily or lotus, a species of eugenia (*E. acutangula*).

*Uchhuy*, *brichh*, or *Uskhuy*, *briksh*, an undecayable tree.

*Udh*, *kuchcha*, half green. *Udh*, *puckka*, half ripe. *Ud*, *khil*, a, half blown. *Ud*, *khoola*, half open.

*Ud*, *ruk*, ginger (green). *Ud*, *us*, lentils.

*Ufs*, gall, both the tree and the nut.

*Ug*, *us*, *ti*, the large-flowered *æschynomene* (*Æ. grandiflora*).

*Uh*, *ruh*, a reservoir for collecting rain-water for irrigation.

*Uj*, *mood* or *Ujmo*, *da*, a species of parsley (*apium involucreatum*).  
common carraway, a kind of lovage.

*Ujwa*, *yun*, a species of lovage (*ligusticum ajowan*).

*Uk*, *wund*, a species of swallow-wort (*asclepius gigantea*).

*Ul*, *see*, linseed or common flax (*linum usitatissimum*).

*Umb* or *Um*, *buh*, a mangoe, a mangoe tree.

*Um*, *booj*, a species of lotus or water lily (*nymphaea neelumbo*).

*Umbo*, *prus*, *adun*, the clearing-nut strychnos (*S. potatorum*).

*Um*, *ra*, a species of hog-plum (*spondias magnifera*).

*Um*, *rood*, a pear.

*Um*, *root*, the white guava (*psyidium pyrifera*).

*Um*, *ul*, *tas*, species of cassia (*C. fistula*).

*Un*, *ar*, the common pomgranate (*panica granatum*).

*Und*, a species of palma christi (*ricinus vulgaris*).

*Un*, *ce*, *soon*, aniseed, or anise burnet-saxifrage.

*Un*, *goor*, a grape.—*Un*, *jeer*, a fig

*Unjur*, *a* or *Injur*, *a*, a nettle.—*Un*, *koora*, a sprout.

*Unk*, *ree*, common vetch (*vicia sativa*) a young sprout.

Un,un,nas, a pine apple.

Up,ur,ajit,a, the wing-leaved clitoria (*C. ternatea*), called also Koyul, and Kou,wath,enthee: also the name of other plants.

Ur,hur, the pigeon-pea cytissus (*C. cajan*), also called Tbour.

Ur,oos, the malabar-nut, and willow-leaved justicia (*J. adhatoda*, and gendarussa).

Ur,joon, a species of terminalia (*T. alata*).

Urk, the curled flowered calotropis (*C. gigantea*), a species of swallow-wort (*asclepius gigantea*).

Ur,uce, the root of Egyptian arum.

Ur,und, a species of palma christa, or castor-oil plant (*ricinus vulgaris*). Ur,un,dee, the fruit.

Ur,wee, Egyptian arum (*A. colocasia*), having an esculent root; called also Ghoyan, or Ghooyan, and in Bengal, Kuch,choo.

Us,gundh, or Is,gundh, flexuose winter cherry (*pysalis flexuosa*)

Uyn,ta, a snail.

Ush,ok or Us,ok, a species of jonesia (*J. asoca*).

Us,og, a species of uvaria (*U. longifolia*), called also Devdaroo.

Us,un, a species of terminalia, the asun tree (*T. alata* or *tomentosa*).

## V.

Vilaetec,kup,oor, a species of sage (*salvia bengalensis*).

## W.

Wam,pee, the chinese wampee-tree or fruit (*cookia punctata*).

Wurd, a rose, a flower; the leaf of a flower, a petel.

## Z.

Zafur,an, saffron crocus (*C. sativus*).

Zhazh, a species of thistle.

Zir,aut, agriculture, husbandry, sown soil.

Zoo,room,bad, zedoary turmeric (*curcuma zedoary*).

Zum,buk, the white jasmine, a lily, or an iris.

Zum,een, the earth, ground, soil, a region, country

Zum,een,dar, a land-lord, a land-holder.

Zurd,a,loo, a common apricot (*prunus armeniaca*).

Zurd,chob, long-rooted turmeric (*curcuma longa*), yellow-wood.

Zur,duk, a carrot. Zy,toon, an olive.

\* \* In Hindoostanee the word *Gachh* or *Durukht* (tree) may be *added* to the name of the fruit or generic denomination, or *omitted*, in like manner as the word *Tree* is added or omitted, according to circumstances, in English.

Examples. *English*—What tree is this? *Reply*—The Mangoe.  
*Hindoostanee*—Yih koun gachh? *Reply*—Amhy.

*English*—That is the Peepul tree. *Hindoostanee*—Wuh Peepul gachh (or *Durukht*).

It must also be remembered that the gender of every tree and plant is either masculine or feminine, there being no neuter in the language.

The rules which regulate the Hindoostanee genders of inanimate objects are various, and in some cases arbitrary; in numerous instances however the feminine noun may be distinguished from the masculine, by the termination—"ee," as in the word *Sabza* (mas.), *Subzee* (fem.), *Sentha* (mas.), *Senthee* (fem.), *Tokra* (mas.), *Tokree* (fem.).

ENGLISH.	HINDOO.		MAHOMMEDAN.
	<i>Hindoostanee.</i>	<i>Bengalee.</i>	
1 Jan	10 Magh	10 Magh, ....	1 Moohur, rum. 30 days.
2 Feb.	11 Pha, goon, ..	Phálguna, Com. when the Sun enters Aquarius.	2 Suf, ur. 29 days.
3 Mar.	12 Chyt, ....	Chaitra, .....	3 Rubee, ool, owul. 30 days.
4 Apr	1 By, akh, ..	Vaisákha, .....	4 Rubee, ool, akhir, or Rubee, oos, sanee. 29 ds.
5 May	2 Jeth, .....	Jyestha, .....	5 Jum, adi, yool, owul. 30 days.
6 June	3 As, urh, ....	Asárha, .....	6 Jum, adi, yool, akhir. 29 days.
7 July	4 Say, un, ....	Srávan, .....	7 Rij, ub. 30 days.
8 Aug.	5 Bha, doon, Bhádra, .....	.....	8 Shub, an. 29 days.
9 Sept	6 A, sin, ....	A'swina, .....	9 Ram, uz, an. 30 days.
10 Oct.	7 Ka, tik, ....	Kártika, .....	10 Shou, wal. 29 days.
11 Nov	8 Aghun, ..	{ Margasirsha, or } { Agrahayana. }	11 Zil, kad, ah. 30 days.
12 Dec.	9 Poos, .....	Pausha, .....	12 Zil, huj, ja, 29 or 30 days

The Mahomedan year is purely lunar, consisting of 12 Months, each commencing with the appearance of the new Moon, without any intercalation to bring the commencement of the year to the same season: but in Chronology and all Documents, the Mahomedans use Months of 30 and 29 days, alternately, adding one day to the last month 11 times in 30 years, thus making up a year of 355 days; the average year is therefore  $354\frac{11}{30}$  days, the 12th of which is  $29\frac{191}{360}$ , differing from the true lunation little more than  $\frac{1}{2}$  seconds. In Bengal and Hindoostan, however, the majority of the people adopt the Hindoo Kalendar.

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---

CONSIDERING gardening as a mere art that may be performed by even the most ignorant labourer, manuals or books of instruction would be useless; yet this is the point of view in which it is almost universally held in this country, and hence the slow progress hitherto made in the cultivation of such produce of the garden as is generally held in estimation by the European portion of the community, left as it generally is, to the simple Hindoo mallee (or garden-er,) it is not to be wondered at, that our bazars want what are deemed the more delicate articles of vegetable production for the table; and that what we have, are confined to the space

of a few months only in the year. The mallee estimates that because he had a good crop of cabbages from a certain spot of ground this year, he shall have an equally fine crop from the same spot in the next season ; and would not conceive that there could be any causes arising from the production of this year's culture to depreciate the quality or injure the growth of the like article in the next year. The native malee, uninstructed as he is, looks only on a cabbage as a cabbage, without reference to the variety of the species, or that one kind may be more delicately flavoured, and hence more worthy of his attention, than another ; he supposes he reaches perfection when he brings before you an immense drumhead, or other large sized description that would require a boiler to be made especially for its reception, and he looks at you while presenting it with an air of triumph, little heeding that your preference would be given rather to the small close early york, or the delicate savoy ; but at the same time he can hardly be blamed for his mistake, since we have never ourselves looked on gardening perhaps otherwise than a mere art, requiring manual labour alone to bring it to perfection ; and having this idea

ourselves, have never thought of informing him that it was rather to be ranked among the sciences, and that some study of the character, habits, and natural localities even of divers plants must be required to bring gardening to perfection. It is this investigation of the natural habits and properties of plants, that shews us how wonderfully they have been formed to answer the objects of multiplication and preservation, and how admirably they answer the purposes assigned them by nature of ministering to the wants and gratifications of man. The examination and study of these, forms the science of gardening, and combined with the manual labour, or that portion forming the "art of gardening," constitutes all that is necessary to perfection. It is not however the object of a little work like this, intended only as a handbook of ready reference, to go very deeply into the subject as a science; larger works must do this, of which perhaps those of Loudon, and the more scientific one by Sir Humphry Davy, are among the best of the present day; the scientific portion therefore will be confined to such short remarks as may facilitate the understanding the subject sufficiently to give directions to the native mallee.

## ORGANIC CONSTRUCTION OF PLANTS.

The first and most prominent distinction that is perceptible to mark the difference between minerals and such productions as are endowed with what is commonly understood by the term life, is, that the latter are found with organs adapted to fulfil the functions to which nature has destined them. Unorganized substances may be increased or lessened in size by mechanical or chemical alterations, either by the addition of particles having similar conformation, or by a combination with substances originally dissimilar; but they have no power for converting them absolutely into their own nature. This is the office of organs in beings possessing life, and one of the principal functions they have to perform is nutrition, whereby organized bodies are increased in size by receiving internally particles of matter of a nature different from their own, which they assimilate to their own substance, and which in other words forms the food whereby they are nourished. Organized beings have also the power of reproducing their own species, varied however by the description of nutrition afforded; minerals may be

separated into smaller fragments by fracture, but they are incapable either of receiving nutriment, of growing, or of reproduction, which are the peculiar properties of organized bodies. The two classes of these latter are animals and vegetables, and of these the former having the power of locomotion are formed with an organ to store a supply of food—the stomach, whence by the process of digestion it becomes fitted to pass through the several absorbent vessels, and to be circulated through the system; vegetables not having this locomotive power, but being attached to a particular spot, have no need for such a receptacle, but seek their supply of nourishment through the extremity of their roots. The organs of plants are so minute that even with the assistance of a powerful microscope it is often extremely difficult to distinguish the structure of their several parts with that accuracy that is requisite to ascertain their precise functions; and a discussion of the details would burden too heavily the pages of a work of the nature now intended. Leaving the reader who may be curious to ascertain more particularly the nature of these, to refer to more extensive works, it will be only necessary to proceed with the following.

## ROOTS, AND THE MOUTHS OF PLANTS.

The office of these organs is to nourish and preserve the plant, and for this purpose there will be found at the tip of every root fibre a small spongy sucker, or to use a more familiar term, a mouth ; and although in most plants we cannot discover any direct opening, it is clearly ascertained that fluids are sucked up or absorbed by these mouths, or as they are called, *spongelets*. The largest and most distinguishable of these are to be found in such trees as grow so near a tank or river as to have their roots exposed to a direct communication with the water ; in the roots of beans also, and the extremity of the tap root of the turnip, &c. they may be sometimes clearly observed ; these communicate with vessels branching through the larger fibres of the roots, and eventually ascending the stem, but their openings are so small as not to afford admission to any fluid that is dense or viscous ; any solid food not dissolved in water is incapable of finding admission, and hence, although water which has flowed through the manure of a farm yard abounds with particles most nutritive to vegetables, it is found to be too thick to pass these



minute openings, unless copiously diluted with water, clogging and obstructing the spongelets, and hence causing absorption to cease; the consequence being that the leaves become yellow and fall off, or as gardeners call it, are *burnt* by the heat of the manure. For the same reason also, lime, pounded bones, or shells, cannot, until dissolved by water or partly dissipated by putrefaction, obtain access through the spongelets. The compression or destruction of these too in transplanting, by depriving the plant of its natural food in that proportion to which it has been accustomed, causes the withering observable after that operation; continuing until these spongelets can be either renewed or place themselves in similar freedom in the earth, that they enjoyed before removal. At the same time this evil if not carried to too great an extent, becomes the source of benefit to the plants, since when obstructed or bent in this way new fibres spring out from other parts of the root, forming themselves out of the materials that would have otherwise enlarged the old ones; in this way the plants acquire a greater number of mouths the more frequently they are transplanted, a circumstance that the gardener avails

himself of, for the purpose of strengthening his plants by increasing their powers of absorbing nutriment, or feeding, by multiplication of the spongelets, or mouths; a subject worthy of being borne in mind especially in a country like this, where they are so likely to be weakened by the over growth of superterrane vegetation, produced by the excitement occasioned by a heated atmosphere. At the same time it must be recollected that each removal tends to check the growth by obstructing for a time the root tips, or in other words, starving the plant, as well as throwing its whole strength and energy for a short period to the formation of new fibres as the sources of making future increased supplies of nutriment. When this is not desired, care must be taken by lifting plants with balls of earth, so as not to disturb the root fibres, or by carefully avoiding injury to these by spreading them out by hand in their new situations, and this knowledge of the construction and growth of the spongelets and fibres has led to the successful practice of removing even full grown trees.

Roots are either *annual*, or living for one season, *biennial*, surviving two seasons, or *perennial*, lasting for an indefinite number of years;

and they consist of two parts, *caudex*, the stump, is the body of root whence the trunk or stem ascends, and the fibrous portions spring out; and *radicula*, the fibres branching out into the earth. There are several kinds distinguished by botanists, viz. *Radix fibrosa*, the fibrous root; *Radix repens*, the creeping root; *Radix fusiform*, the spindle-shaped root; *Radix præ-mosa*, the abrupt root; *Radix bulbosa*, the bulbous root; *Radix tuberosa*, the tuberous root; and *Radix granulata*, the granulated root.

1st. *Radix fibrosa*, the *fibrous root*, is the more simple and frequently occurring form, consisting of a collection or bundle of fibres connected by one common head, and not unfrequently springing directly from the base of the stem;—the roots of most annual herbs and grasses are of this description.

2nd. *Radix repens*, the *creeping root*, having a long subterraneous branch spreading out horizontally in the ground, from whence the small fibres spring in little bunches at various distances; such a root is extremely tenacious of life, as any part of the subterraneous stem where there is a joint or articulation, will, if placed in the earth, give birth to fibres and form a new root;—of this kind is the mint,

and many of the extremely troublesome grasses of this part of the world.

3rd. *Radix fusiform*, the *spindle-shaped root*, or as it is commonly called, the *tap root*, from its tapering towards the end. This root is but scantily provided with fibres, but to compensate for this disadvantage, the root is of so moist and fleshy a nature as to afford ample store of provision, and the depth that it penetrates into the soil enables it to obtain a large supply of the moisture and nourishment best suited to promote its growth, which it absorbs almost entirely through its taper extremity ;—carrots, radishes, parsnips, &c. are of this class.

4th. *Radix præmorsa*, the *abrupt root*, is another form of the foregoing, so called from its abruptly terminating as if broken off, or as if bitten ;—of this class are the scabious, the primrose, &c.

5th. *Radix bulbosa*, the *bulbous root*, perhaps improperly so called, as the bulb rather forms the base of the stem whence directly spring the leaves, for the tufts or fibres pendent from the bulb are in reality the roots ;—of this kind are the amaryllis among flowers, and the onion, &c. among vegetables.

6th. *Radix tuberosa*, the *tuberous or knob-*

*bed root*, consisting of flesh knobs connected by common stalks or fibres, each knob or even portions of each being capable of reproducing a plant of its own ;—of this kind are the potatoe, &c.

7th. *Radix granulata*, the *granulated root*, is formed of a cluster of little bulbs or scales, connected by a common fibre ;—of this kind are the saxifrage, or London pride, &c.

#### TRUNKS, STEMS, OR STALKS.

Every plant has a stem through which the sap circulates, and from which the leaves and flowers spring. The stem is either simple, as in the lily, or branched, as in most other plants ; and as the functions of the root are to suck up the nourishment from the soil and transmit it to the superstructure, those of the stem are to distribute this nutriment to the several parts of the plant, leaves, flowers, &c. Its various parts or rather forms are—1. *Caulis*, the stem properly so called, which bears both leaves and flowers, as the trunks and branches of all trees and shrubs, as well as many herbaceous plants. 2. *Culmus*, a stem or culm, the peculiar stem

of grasses, rushes, and similar plants. 3. *Scapus*, or stalk springing immediately from the root bearing flowers and fruits, but not leaves, as in the primrose and the strawberry. 4. *Pedunculus*, the flower stalk springing from the stem or branch, and bearing flowers and fruits, but not leaves. 5. *Petiolus*, the foot stalk, a term applied exclusively to the stalk or support of the leaf. There is a point or spot separating the stem from the root, called the neck, and which may be considered the seat of vitality, for if you cut off the root of a young growing plant it will shoot out again, and if you cut down the stem it will be renewed; but if this neck be injured the plant will certainly perish.

Linnaeus divides plants into two classes, from the mode in which stems spring from their seeds in the process of germination; these he names from the number of cotyledons, a name given to that sort of leaf which the fleshy parts of the seed forms itself into by germinating, and constituting at once a defence and source of nourishment to the young plants; the classes are, *Monocotyledon*, or bearing one cotyledon, and *Decotyledon* or twofold. Of the first, are the palm, the coconut, corn, &c.; in the second, the most

distinguishable, and doubtless often observed by the reader, are the bean, the pea, lupine, &c. ; mushrooms and other fungi, as also lichens, form a third class, having no cotyledons, and hence denominated *Acotyledons*. The wood or hard part of the stem is composed of many layers extending every year of growth, as is also the bark, but not so easily observable, as its outer coats becoming too hard to be distended by the pressure occasioned by the increase of the stem, crack and fall off; it is at first green, but by increased exposure becomes darker and dry, and the vital part of the stem appears to be situated between the young layers, or outside of wood, and the same part, or inner coating of the bark, since the plant suffers most by injury to that part. The sap is believed to ascend through the former of these, or the young woody layers, through which it, if unobstructed, ascends in straight lines, part being afterwards exhausted by the leaves, and part descending through the bark; the portion requisite for nourishment of the plant being retained in its progress. The sap rises most actively in the spring, when it is more required for the nourishment of the young buds that are to be then developed, but

this extra portion instead of rising through the young wood ascends nearly in the centre of the stem, and thence is transmitted through the several layers of wood to the buds, and the rapid absorption of this description of sap is facilitated by heat. This process appears to be yet but imperfectly known, and it is unnecessary therefore here to canvass the claims of the several theories that have arisen respecting it.

#### ON LEAVES.

The leaf is a flattened expansion of the fibres of the stem from which it shoots, connected together by a layer of cellular tissue, called the pabulum, or aliment, the whole covered with a delicate cuticle, or skin, and formed so as to present a large surface to the atmosphere ; the hue is generally green, but when otherwise, it is said, in botanical language, to be coloured. It is unnecessary here to define the various classes into which leaves are divided by botanists according to their various forms ; they will be found fully explained in botanical works. Proceeding therefore to their general character and parts, the fibres, or as they are



commonly called by the unscientific, the veins, will be found to spread out in various directions ; the principal are generally dividing the leaf from the base to the extremity, from this others branch out laterally, and from them again still smaller ones may be observed to issue ; they all however terminate in pores, so constructed as to admit of a free evaporation or absorption of moisture, as well as to admit and give out air, and the effect of moisture must have been observed by every one. By absorption from the atmosphere the leaves become refreshed, this may be particularly observed in those of the pine-apple after a heavy night dew, or sprinkling with a fine rosed watering pot ; but by evaporation, especially when separated from their stalks, they soon fade and wither. The nutritious juices imbibed from the earth and become sap, as before noticed, are carried by appropriate vessels into the substance of the leaves, for the purpose of being acted upon by the air and light, no less than by heat and moisture, to produce that change which is necessary for the evaporation of the necessary secretions, whether resinous, oily, mucilaginous, saccharine, bitter, acid, or alkaline, and this is from the leaves returned into

the bark. The under surface of the leaf has the ribs or fibres most prominent, and is generally more hairy and of lighter hue than the upper side, as well as abounding more in pores. The bractea, or floral leaves, differ from others, growing as their name implies, around the embryo blossom, or bud, which they seem to protect and aid in preparing the nutriment necessary to feed. The want of light deprives leaves of their colour, and diminishes their powers of evaporation, so that a plant thereby retains an excess of liquid, becoming in fact dropsical, on which principle endive, celery, frequently also the hearts of cabbages, lettuces, &c. are what is called blanched, or rendered white, and less strong in flavour as well as less woody.

#### ON FLOWERS.

Of the parts of flowers the Calyx, or cup, is the external coat, protecting the bud before it expands; it consists of several parts, resembling small leaves both in form and colour, sometimes so joined together as to form a cup apparently of one piece; above the calyx rises the

Corolla, or coloured part of the flower, composed of several petals or flower leaves, either distinct or joined together, at the joint of which is the Nectary, or receptacle for the sweet fluid, whence the bee derives honey, and serving to nourish the blossom; within this is, in most plants, the seed vessel, having at its summit a thread-like tube called the style, with the stigma or small spongy swelling at its extremity, for the reception and transmission to the seed vessel of the dust or pollen contained in the anther, or case, loosely attached to the extremities of the stamens, or thread-like filaments generally observed in blossoms clustering near the foot of the petals. This pollen is essential to the fructification of the seeds contained in the seed vessel, which without it would not come to perfection; and a knowledge of this fact will aid the gardener in securing the object of his culture with such plants as like the melon, the vegetable marrow, &c. have the seed vessel in one blossom, and the anthers in another, when bringing the two into contact by the hand will often secure the production of fruit otherwise left to the precarious conveyance of the various insects that flit from blossom to blossom; by the same means varieties are also produced of the

same plants by bringing together blossoms of divers kinds.

#### ON SEEDS OR FRUITS.

After the flower has performed its office of fructifying the seed, the petals and other organs not destined to become part of the fruit wither and fall off, whilst the seed vessel becomes distended, and gradually assumes the appearance of fruit, bearing various names according to its form and the mode of opening what is called the carpel, or external frame of the seed vessel, to allow the escape of the seed at maturity. Of the seed itself little need be said: the formation of the embryo plant and its connection with its cotyledon may be observed, with the naked eye, in the bean, by any one who will be at the trouble of splitting one open, the skeleton of the young plant making a slight indentation in either side; it will be found not situated, as might be expected, in the centre of the bean, but at that end by which it was connected with the pod by a short pedicle or branch; this spot being called the eye or hilum of the seed, and through it the pedicle

conveys nourishment to the embryo plant until the seed is ripe, when the pedicle withering, the seed becomes detached, leaving a small scar at the base of the seed.

#### FOOD OF PLANTS.

As plants unlike animals are unable to travel in search of that nourishment which is most agreeable to their nature, they can only procure such food as they find near them. And as it has been already shown, that the mouths of the root fibres are constructed for the admission of liquid only, water becomes an indispensable requisite in all plant food, although it will not, as has often been erroneously asserted, alone serve for their nourishment. Another indispensable ingredient in the food of plants is air, especially when held in combination or mixed with water, whence the giving water in large quantities direct to the soil will generally in cool weather be less beneficial than if the water were distributed from the fine rose of a watering pot, so that every drop may mix with and carry down to the roots a portion of

air ; in this country however fermentation is so rapid that, except in cold weather, this addition to the benefit derivable from the free bestowal of water is denied to the gardener, as by distributing the fluid from a fine rosed watering pot the water being scattered is apt to lodge in the joints of the branches, the folds of the leaves, &c. where fermenting, it rots and destroys the plant. Water stagnating too on the ground becomes unwholesome food for plants, chiefly on account of its not having the opportunity, afforded by circulation, of mixing with air ; and soils which, from their stiff clayey nature, prevent this free circulation, are termed cold or sour ; their defect however is the want of a due supply of air.

Although too much water in a soil is undoubtedly injurious, yet if that be kept in free circulation, and its various particles in contact with the air, (and this in the case of stiff soils may sometimes be effected by the admixture of ashes, sand, and the like, to open their texture) the evil consequences will be lessened. Without a free combination of water and air, not merely will the process of vegetation commence slowly, but its progress, when begun, will be soon checked, the leaves drooping and becoming

flaccid, until at last they wither altogether and fall off.

The moisture or water of garden soils is besides the above ingredients more or less mixed with what is called humin, being the chief ingredient in all manures; but when pure this will not mix with water, and plants cannot therefore benefit by it until mixed and thinned down; but the best combination is produced by lime, potass, or ammonia. Each of the ingredients of plant food therefore will be found composed of the simple gases; thus, *water* is composed of hydrogen with oxygen gas; *air* consists of oxygen with nitrogen; *humin* contains carbon and hydrogen; *ammonia* has three parts of hydrogen and one part of nitrogen; whilst *lime* and *potass* are composed, the one of potassium, the other of calcium in combination with oxygen, the three last also frequently combined with carbonic acid gas. Of these, it is carbon that constitutes the larger portion of the solid substance in all plants, whilst water is the chief fluid portion; whence hydrogen contained in water, in humin, and in ammonia is so important; but to go minutely into this subject would exceed the bounds we have placed on our remarks. The mineral parts of the soil consisting

as they do of clay (argillaceous matter) sand, or gravel (silicious matter), chalk or lime (calcareous matter), and iron (or ferruginous matter) contribute but in a small degree to the food of plants, and appear chiefly useful in dividing and separating the nutritive portions consisting of decayed vegetable and animal substances. These several substances, however, mixed together in various portions, form the basis of every soil, and none will be fertile that does not contain nearly equal portions of the three first; any excess of either of these will cause the fertilization to be proportionately affected to a degree not to be permanently recovered by the addition of even a large proportion of any of the other three ingredients. Such then is the description of food essential to the well being of all vegetable productions, and on the nutritious parts of it they feed most heartily in the day time, and in open places where they are much influenced by light; whence artificial watering may well be supposed most beneficial in the morning, just as the plants may be said to thirst for their breakfast.



## MANURES.

It is upon the study of the component parts of the food of plants in their natural state, that the system of apportioning manures is founded. These are of various kinds, and to be sought for alike in the animal, the vegetable, and the mineral kingdoms, of which the two former are the most absorbent and retentive of moisture; and it is to be remembered that the more the component parts of a soil are mixed together, and the more they are separated and divided into minute portions, the more extensive are their powers of absorbing and equally distributing their nutriment, and the greater, consequently, the fertility of the soil. Besides this, when the soil is well pulverized the easier is it for the minute fibres forming the roots of plants to penetrate, and hence the greater is the number produced, to the benefit of the plant by the increase of its powers of obtaining nutriment. Most kinds of animal and vegetable substances require the process of fermentation to take place before being fitted for manure, and the best is undoubtedly that obtained from a fair mixture of animal and vegetable matter, such as is to be found in

an English farm yard ; hence every garden should have a large hole into which should be every day thrown the sweepings of the stable, and especially the urine of the horses, itself a most powerful manure ; and it would be well therefore to have this hole so placed that all the drainings of the stable, including that and water wherewith the horses' feet, &c. have been washed, might be allowed to run into it, adding to the rapidity of the fermenting process no less than to the richness of the manure. Another hole should be made for the reception of the like gleanings from the cow or bullock shed, and the sheep pen, cow dung being very good for all kinds of kitchen plants, and it possesses the advantage of requiring no fermenting to fit it for immediate application to the soil. These holes should not be left exposed to the sun, but should rather be covered to prevent too rapid an escape of the gases generated in the process, and the temperature of the manure when under fermentation should not exceed 100° of Fahrenheit ; if it ever exceed that, the dung should be immediately spread abroad. A third hole should contain all the leaves of trees swept from the garden, the refuse of cabbages, and other vege-

tables cut, the prunings of trees, weeds, &c. all which if left to ferment and rot, become excellent sources for reviving the exhausted soil, and in decay, form a rich mould for all purposes; in India a year is quite sufficient to complete this process, and fit the stock for use, as '*leaf mould*' is most useful when the soil contains too much sand, chalk, or clay, and very proper for softening, and in combination with sand for lightning, the soil for tender plants, and for those in pots generally.

*Bones* when procurable in sufficient quantities have been found a most excellent manure, much liked by most plants, especially cauliflowers, the size and quality of which have been known to be much improved by their application.\* They must be beaten down to a fine powder, the expense being amply repaid by their extensive fertilizing powers, containing lime and oil in abundance, the latter in the proportion of about fifty-one parts out of a hundred; horn, hair, feathers, the refuse of skins and leather, are all useful for the same purposes.

*Fish* may be used on any kind of soil with advantage, but it cannot be dug in too fresh,

\* This was most successfully tried at Berhampore by Mr. F. Whitworth Russell.

and must be employed only in limited quantity, or mixed with sand, to prevent its raising too luxuriant a crop. Their skin being gelatine is readily dissolved in water, whilst under it is found fat or oily matter, and their fibrous substance contains all the essential elements of vegetables, whence its mode of operation may be easily understood.

*Linseed cake* is an article too valuable as a food for cattle to be much used as a manure, though of great utility in wet clayey soils. The water in which hemp or flax has been steeped contains also considerable fertilizing power, as it holds in suspension much vegetable extract. *Sea weed*, where procurable, from containing gelatine, salt, carbonate of soda, and carbonaceous matter, is of service to some soils if applied fresh ; but as a manure is transient in its effects, not lasting more than one crop. The weed from tanks also makes a good top dressing.

*Wood ashes*, containing carbonic acid, may be sometimes used, but have very short duration in their effects.

*Lime*.—Quick lime has the faculty of giving solubility to many substances, especially to vegetable matter, rendering them proper food for

plants. Chalk, marl, or carbonate of lime, only improves the texture of the soil, and acts as one of its earthy ingredients ; it is well suited therefore for stiff soils ; but lime should never be applied with animal manures, unless when they are too rich, or merely to prevent noxious effluvia.

*Clay* is a good manure for sandy soils, but if dug from any depth below the surface of the earth, it must be exposed for some time to the action of the air before application to tender plants. In a burnt state it serves to alter the nature of soil by rendering it more friable, and is, in England, sometimes used on fallows or turnip land in like manner ; and for the same purpose, may be used the refuse of old buildings, or the dust from brick made roads.

In *alluvial* soils deposited by the river after inundation, or forming the upper layer of the bottoms of some tanks, is to be found light surface soil, fine sand, and decayed vegetable matter, whence it forms a good manure for any sandy or chalky soil, and for the renewal of flower borders.

## ON ROTATION OF CROPS.

There are few things less thought of in this country, although very few subjects are more worthy of consideration, than the rotation of crops, whether in field or garden. With the former the present work has nothing to do, these observations being confined only to the latter. It is well known that plants, like animals, do not appropriate all the food they take, but that having the fit organs for separating what they find necessary, that which is useless is rejected ; and it is well known that besides the water and gases thrown off by the leaves the roots also eject a sort of excremental slime, different in various plants, but always injurious to such of the same kind as may follow on the same ground ; at the same time the peculiar nutriment required for a particular plant must be weakened by the absorption of the same plant preceding it. Thus the slime of cabbages will injure cabbages, though harmless to peas, and in like manner with all other plants. Another reason for an attention to this due succession of different crops is formed on the fact, that there are many insects, of the moth and water kind, that live on the crown of the

roots of particular plants, multiplying themselves infinitely when the spot presents a succession of the same or nearly similar food, but if a crop intervenes that is uncongenial to them, the whole race perish for want of food. This subject having but recently met attention from agriculturists, no positive rules for the succession of culinary plants can be laid down: these must be left therefore for the judgment and experience of each individual to frame for himself, especially as the climate would also have an influence on the succession, and what might answer admirably in England would be often found unsuccessful here. The principles of scientific gardening however requires this rule to be observed—that no long stalked crops, such as peas, &c. should be repeated on the same soil without the intervention of some roots or herbage, and vice versa. An occasional cessation from crops or fallowing is also desirable, with the addition of dunging for all crops, and should always occupy some small portion of each year. The following principles for guidance of the rotation of crops have been laid down by the best French authors, and deserve attention:—

- I. Every plant exhausts the soil ;
- II. All plants do not exhaust the soil equally ;
- III. Plants of different kinds do not exhaust the soil in the same manner ;
- IV. All plants do not restore to the soil the same quantity or quality of manure ;

V. All plants are not equally favourable to the growth of weeds ;  
and from these principles the following results may be deduced :

1. No soil, however well cultivated, can long nourish the same crops without being exhausted.

2. Every crop impoverishes a soil in proportion as it is more or less restored by the plant cultivated.

3. Perpendicular rooting plants, and such as root horizontally, ought to succeed each other.

4. The same kind of plants should not be repeated too frequently.

5. Two plants favourable to the growth of weeds should not succeed each other.

6. Such plants as are known to exhaust the soil considerably, should only be planted on new land, or that which is strong from manuring.

7. Plants that are less exhausting should succeed those that are more so.



## OF HEAT, LIGHT, ETC.

The heat of the sun is the cause of the growth, and its light of the maturity of plants. Animals will live without much light, but no plants can exist for any time without the presence of this element, whilst the external heat of the air is indispensable to a regular and sufficient flow of the sap, and hence the artificial heat produced in hot houses in England serves to forward the growth of plants of tropical climates, and bring them to that maturity they could not otherwise attain; and in like manner the increased activity given to those of colder climes when brought to India, so increases the growth as to exhaust all their powers in forming new shoots, leaving no strength for the formation of flowers and fruit. Heat is radiated by the sun to the earth, and is reflected back again, should dense clouds afterwards intervene near the earth; but if at much elevation, these cease to reflect so much of this element as they receive from the earth. Fogs also like clouds will arrest the heat, which is reflected upwards by the earth, and if they are dense and of considerable perpendicular extent, may remit to it as much as they receive. And

the water deposited upon the earth during a foggy night may be derived from either of two sources ; one, the precipitation of moisture from a considerable part of the atmosphere in consequence of its general cold ; the other, a real formation of dew from the condensation by means of the superficial cold of the ground of those parts of the air which comes in contact with it.

The fogs during the cold weather, and especially towards its close in this part of the country, descending from a height, have the same effect as dense clouds at a distance from the earth in receiving more heat than they reflect back ; and hence at this period they cause the temperature to be very sensibly reduced towards the morning, when they descend to the earth ; hence, too, if they continue late in the season they have the effect of destroying the early blossoms of the mango, often rendering every blossom on the side of the trees whence they are brought by the wind unfruitful.

THE NATURALISATION AND ACCLIMATION OF  
PLANTS.

In estimating the effects of change of climate on plants, the most important consideration is temperature. The soil, the air, the water, are of comparatively little moment compared with the increase or decrease of heat. In transplanting from a colder climate, an elevated situation is desirable, and a sufficiency of water to provide for the more abundant evaporation to which the plant becomes subjected, and this is generally more easily effected than the acclimation of those of the torrid zone to the colder climates of Europe; yet there it has been carried to such perfection that many products of Asiatic origin have become completely naturalized, such are the potatoe, the kidney bean, the cucumber, the nasturtium, the dahlia. It must not be expected however that this acclimation can be effected at once,—several generations must often be gone through ere the object is effected, and people here should be content to cultivate a plant they desire to naturalize for the first two or three years at least, with a view only to propagation, and not for use.

## THE PROPAGATION OF PLANTS.

For the increase of vegetable production proportionate to the wants of man, means have been provided for the perpetuating and multiplying the species. The most simple and natural of those methods is by *seed*, the process of maturity which has been already described. When it has reached maturity it detaches itself from the parent plant, and unless removed by the gardener drops into the soil, where it germinates and takes root, springing up a new individual to replenish its kind. In a state of nature these seeds are carried by various means, and for this purpose some seeds have down, or wings, even, to facilitate their transport; such are the thistle, the geranium, the maple, &c. To give growth to this embryo, heat, water, air, and darkness are indispensable: the first gives development to the nourishment contained in the lobes, whence in cold climates, and even during the cold season here, seeds remain long in the earth without coming up; the second softens by its moisture these lobes, fitting them for the action of heat; whilst a free circulation of air is indispensable to the due supply of oxygen and the carrying off

the carbonic acid gas, which is prevented if the seeds be placed too deep in the earth ; whilst if not duly covered, the excess of light carries off the oxygen so requisite in this stage of growth.

It is true exception might be made to these rules in the fact, that seeds of corn in some seasons when there is an excess of wet weather germinate in the light, whilst in the ear even ; but such seeds never produce strong plants. Many seeds are benefited by steeping an hour or two in water ; and carrot seed is forwarded and made to sprout sooner by being tied up in cloth and buried in a very moist corner of the garden until the germ appears, before sowing in the spot required for production of the plant. Too much wet however will injure all seeds, by rendering them dropsical, and liable to rot in the ground when sown. Late years however have introduced the use of hot or boiling water to stimulate seeds, especially such as have been kept for some time, or have been brought any great distance. The formation of the seed has been before described, there is therefore no occasion to repeat it here ; it is only necessary to add, that when the seed has found its way to the surface, and form-

ed the first sprout of its root, the lobes become changed into what are called seed leaves, and assume the office of preparing pulp from the sap now taken up by the young root, and so essential are they to the existence of the plant, that if eaten off by insects or broken accidentally, the plant will inevitably perish; they should be carefully preserved too in those that require to be transplanted, as it is not prudent to remove a plant until it has acquired strength sufficient to dispense with the use of the seed leaf, which then drops off itself, and none should ever be removed until this has taken place. Although plants are generally propagated by seeds, yet many of them are increased by other means, either because they do not always ripen seed, or because the process by that method is slow and less certain, frequently occupying several years to come to perfection, whence many different modes of increasing various kinds of plants have been adopted; of these perhaps *dividing the roots* is the most simple. Every root has what is called the crown or neck, whence springs the body of the root; and whenever these increase in number so as to furnish more than one to each plant, as is the case in the violet, &c., the root may be divided into as

as many parts as there are crowns, each being capable of separately supporting itself; this must be carefully done with a sharp knife, or by gently pulling them apart. Other roots are of a tuberous form, such as the potatoe, the dahlia, &c. and have a similar part called the *eye*, capable of sending forth a stem; these may be cut in pieces, each portion that contains an eye being capable of propagating its species. Others again, of a bulbous character, send forth *small bulbs* from the base of the larger ones, as in the amaryllis, the onion, &c., and these if carefully separated from the parent root, will soon be capable of sending forth new buds of their own; it is however advisable to wait until these young bulbs have formed roots of their own before they are detached, as, if that is carefully observed, a failure in the production of the new plant is next to impossible. Some few plants are so prolific in their nature, that each *leaf* if put into the earth will give birth to several young plants, as in the arum, and a few others.

Many plants instead of having a number of crowns or eyes, have only one, but send off *short stems*, like the aloe, the yucca, &c., or *runners* issuing from the summit of the root and creeping along the surface of the soil, pro-

ducing on the extremity, a fresh root and leaves, thus forming a new individual on decay of the connecting link, as in the strawberry ; the time for taking off these offsets must be regulated by the season of the year, the best period being the close of the rains, as it is important to have the young plants as full of vigour and moisture as possible at the time of their removal. The young plants called *suckers* which spring up from the deeper roots of some shrubs and trees near to or at a distant from the parent trunk, as in the rose, the jasmine, &c., may be taken up with root fibres attached to them, but they take a long time, if propagated by this means, to come to that degree of perfection necessary for the production of blossoms and fruit.

*Slips and cuttings.*—The younger twigs of many plants and shrubs will continue to live if put into the earth, until the leaf buds that are below the surface are converted into roots, and produce fibres, by which means many plants, as the rose, the mulberry, &c. are multiplied as easily as by the sowing of seed, with this additional advantage, that they bear blossoms or fruit much sooner. The success of this process depends on the end of the slip or cutting



not being too young or soft, otherwise it will become gorged with moisture, and rot; at the same time if it be too old and hard, it will not take up sufficient water to keep it alive. It is to be remembered also, that the root fibres will always spring from the foot of a leaf bud, and it is therefore desirable to cut the branch selected for raising a new plant with a slope on the opposite side of the bud, whereby the operation of forming the new fibre is much facilitated, especially in such plants as are woody and close grained. Neither a very dry nor a very moist soil will answer for this operation, and a considerable mixture of sand is preferable for delicate plants, even to the extent of two-thirds sand to one-third of rotten dung and vegetable mould in equal proportions, with frequent gentle waterings, or what is yet better, placing the pot in a saucer kept constantly filled with water, so as not to gorge or rot them. They should not have too much light, and ought to be closely trimmed from leaves, and above all from flower buds, as these serve to exhaust them, and hence retard the putting forth of the root fibres.

*Layers* is a mode of propagation used with plants that are too delicate, or that cannot be so

readily extended by cuttings, and even sometimes pursued without such reasons, because more certain in its effects. As with the former they should be thinned from all superfluous leaves or buds, but especially kept from flower buds, with some plants, as in the jasmine, so common here, and the raspberry. The operation of layering is a natural process, effected by the spontaneous bending down of the branch to the surface of the soil. To effect this artificially the branch should be slit with an upward slope half way through, with a sharp knife, directly under a leaf bud or joint, and then the cut part must be fixed a little under the ground with a small hooked peg, and carefully covered over, when root fibres will form; and after some time the layer may be separated from the parent plant and removed elsewhere. This is the best mode of propagating carnations and choice pinks, and succeeds with almost every kind of shrub and evergreen. What is called Chinese grafting is performed on the same principle, the branch being prepared in the same manner as for making a layer, but instead of placing it in the ground it is surrounded by a large ball of clay and cow dung, well kneaded together, over which a piece of canvas is carefully, but not too

tightly, tied. To keep up a constant and moderate supply of moisture to this ball of earth, a small pan or handee of water is suspended over it, perforated at the bottom, and this being kept constantly filled allows the water to drip on the graft, six weeks or two months being generally sufficient to cause the root fibres to sprout into the ball of earth, when the branch may be separated and planted out.

*Grafting.*—When particular sorts of shrubs or trees cannot be procured from seed, or when seedlings would be uncertain in their produce, or be a number of years in blossoming or fruiting, slips or even buds of the sorts required are cut off and fitted to a cut made in another suitable tree or shrub called a stock, by an operation termed *grafting*. The principle on which the union of the grafts and the stock takes place is, that the pulp from the cutting descends to its junction with the stock, where being excluded from air and light, it forms woody fibres instead of roots, as it might have done in the ground; while at the same time the sap from the stock rises into the cutting, whose leaves convert it into pulp. In grafting, all sorts of the same or similar species succeed with their kind. A plan similar to layering, whereby the

branch to be grafted is not separated from its parent stem until the process is completed, is frequently performed, and is the usual mode pursued in India; this process is termed *arching*, and when a bud only is used, and is inserted into the bark of another tree, it is termed budding. All these processes are best performed in the spring, when the sap begins to circulate freely from the accession of heat, whereby the operation is facilitated greatly: and in all of them great care must be taken to cut the parts both of the scion or graft, and the stock or growing plant whereon it is to be placed, very clean and smooth, so as to lay extremely close to each other, as well as to unite exactly the inner bark of the scion with the inner bark of the stock, in order to facilitate the free course of the sap; this being done, it must be carefully and evenly wound round with soft pith or plantain fibres if small, or coir string if large, to keep the two together, and over this should be placed a ball of well kneaded grafting clay, so as completely to exclude the air and prevent the access of rain to the wound, as well as to check the sudden drying of the wood. This last is made from stiff yellow or blue clay, to which is added about a fourth part of fresh

horse dung—the French use cow dung—free from litter, and a portion of chopped hay, the whole being well mixed together with the addition of a little water ; then let the whole be well beaten with a stick upon the floor, adding more water as it becomes dry. This process must be repeated several days until the clay is quite ductile, and yet not so tough as to be apt to crack, and may occupy a week before it is fit for use ; observing to let it lay for not less than six hours after each beating. Some add ashes, drift sand, or even salt, to prevent cracking ; but this is secured by the horse dung, if properly incorporated with the mass. This clay it will be safest to leave on for three months, although frequently the progress of the buds of the graft will show long before that period that the scion has fully united ; the ligatures should then be gradually removed, that the parts may be by degrees innured to the air, and not too suddenly exposed.

## MECHANICAL OPERATIONS.

Before proceeding further with the various processes required for the culture and maturing of the plants in the garden, it will be well to make a few remarks on the mechanical operations necessary: these may be divided into three classes,—those affecting the soil below the surface; those acting merely on the surface; and those on the plants while growing above the surface:—*of these the first are* ploughing, digging, excavating, levelling, ridging.

*Ploughing* is generally had recourse to in the first formation of a garden, for the purpose of breaking up the soil, and in some measure preparing it for the succeeding operations; but it is not always necessary, and need not be repeated after the garden is once formed. A single plough with a pair of bullocks should give one good ploughing to a beegah of 14,400 square feet in the course of a day.

*Digging* is performed in this country with the hoe, or *khodal*, which is a thin wedge of iron, having a lever or handle of wood attached to it at an angle, the end where the two parts join being the fulcrum; of these the most remarkable forms are given in plate I. figures 1,

2, 3, and 4, two of which belong to lower Bengal, and the other two are found more generally towards the westward. In figure 1 it is clear that much power is lost by the fulcrum being in the centre between the hand or power, and the resistance or earth to be dug ; whilst in figure 2, from the angle of union being so acute, this evil is increased by the blade being brought so close to the hand as to obstruct the operations of the digger, and preclude the possibility of penetrating to any depth ; to obviate which, as much as the instrument will allow, the hoe is not unfrequently thrown out of the hand ; this must of course occasion great delay, and but slow progress can be expected from it ; it may however be useful in shaping and cleaning the almost perpendicular banks of tanks, pagars, or mounds. The next instrument, fig. 3, is in use in the province of Behar, and is, as may be observed, a far more powerful hoe, the length of the handle allowing of more force being given to the blow by the increased impetus created by passing through a larger space, while the fulcrum, being nearer to the resistance, adds strength to the power used ; its defect is however to be found in the great breadth of the blade, affording a broader field of direct resist-

ance ; this is improved upon however in the hoe figure 4, the blade of which inserts itself more gradually into the earth from its tapering wedge-like form, whilst additional power is also gained by a yet greater length of handle ; this kind of hoe is originally found in Ghazeepore and the districts above. The handles of all these should be smooth, that the hand may readily slide along them, in raising them from the ground, and the blade should be strengthened by a greater thickness or ridge in the centre.

· The mattock, plate I. fig. 5, called also the hoe axe and the grubbing axe, is an useful implement in loosening hard surfaces, and for grubbing up the roots of small trees or bushes. Another form of the hoe, having two prongs, plate I. fig. 6, may be used in loosening the soil below the surface, and in digging up potatoes or other roots.

· In digging a piece of ground the separation between the dug and the undug portion forms a trench or furrow, and in beginning, a furrow should first be opened at the end where the work is to commence, the earth taken out being carried to the part where it is to terminate, and where it will serve to close



the last furrow. In digging, care must be had to maintain an uniform depth throughout, reversing each spitful, or portion taken up at one cut with the hoe, so that what was on the surface may be buried; each spitful should also be well pulverized, and where the object is to add manures, they should be turned in regularly through all parts; and weeds that are not injurious ought to be buried, whilst those that are hurtful, as well as the roots of strong grasses, bricks, and other extraneous matter, should be carefully removed; the depth of pulverisation of the soil in this operation should never fall short of nine inches, and the best weather for undertaking the work is after one of the showers usually falling in February or March, or at the close of the annual rains in September or October, when the soil is sufficiently moist to admit the hoe with ease; the ground being at other periods, except indeed in the rains when it is too much saturated with an excess of moisture, generally too hard to admit of being broken up, save at the expense of great labour, and with the mattock, or pickaxe, which instruments, strongly as they are generally made, are often broken by the hardness of an Indian soil. For this operation

from ten to fifteen men will be requisite to the beegah, costing at the usual rates in lower Bengal from one rupee six annas to two rupees; but if the soil be hard, as it usually is from the end of November to the end of February, this will be increased to as much as four or five rupees.

*Excavating* is the operation requisite for formation of ditches, for draining land, or surrounding particular spots as a defence from trespass, or in the construction of tanks to secure a supply of water, as well as frequently necessary to afford the means of raising ground otherwise too low to be suitable for a garden. The cost of this depends in a great measure on the distance that it is required to carry the earth dug out, and will vary accordingly from four hundred, to as high as a thousand cubic or solid feet for the rupee; this last being the rate allowed in the construction of public embankments where the earth is taken from close to the site of their formation.

*Trenching* is a mode of pulverizing and mixing the soil to a considerable depth, and should always be the first operation in making a garden; it is true the labour and expense

of so doing is considerable, but it amply repays both by the stimulus it gives to the soil, and the lightness imparted to the ground for a depth sufficient to suit the deepest penetrating roots, all of which are aided by having the means afforded them of extending their fibres in all directions in search of the nourishment they require. According to the ordinary mode of trenching, the surface soil would be put at the bottom of the trench, and the subsoil brought to the top; but this in many soils would be to exchange a good turf peat or alluvial soil for clay or sand, and even in the best ground would bring up earth that has not perhaps for years been exposed to the action of the air or sun, and hence wanting in many of the properties for fertilization which it would require a long period of exposure to obtain; care must be taken therefore to keep the top soil to the top. The directions for doing this, as laid down by Cobbett, are the plainest and most clear, and have been besides most successfully pursued in this country; they are as follow—The “piece of ground” ought to be marked into *strips* or *lifts*, each “a rod wide, in the manner described below—

“ This division into narrow strips takes place  
“ because the earth which comes out of the  
“ first trench must go to fill up the last  
“ trench ; and, therefore, in this case, there  
“ would be pretty nearly a hundred cart loads  
“ of earth to be carted or wheeled from one  
“ end of the piece to the other ; *whereas*, by  
“ proceeding in the way of strips, you will fill  
“ up the trench with hardly any wheeling at all.  
“ The ground being laid out in strips, you be-  
“ gin at *a*, and take off all the top earth\* of a  
“ cross strip two feet wide ; and you wheel  
“ that earth to the end of the further strip *s*.  
“ The little cross strip *a* is marked out by  
“ straining a line across the great strip, and  
“ making a chop with the spade. When you  
“ have taken away the top earth of *a*, mark out  
“ the cross strip *b*, and wheel away its top  
“ earth also to the same place as before, laying

\* To the depth of a foot and a half.

“ this top earth altogether in one round snug  
 “ heap, just without the limits of the ground  
 “ at s. You have now got the top earth away  
 “ from the two first trenches *a* and *b*. You  
 “ next take out the bottom earth of the trench  
 “ *a*, down to the depth of three feet,\* and you  
 “ wheel that away and put it into a round and  
 “ snug heap, distinct from the other heap,  
 “ at the end of the further strip at s. You  
 “ have now the trench *a* quite empty down to  
 “ three feet deep ; you then *move* the earth  
 “ with a spade, or other tool, to the depth  
 “ of nine inches at the bottom of the trench  
 “ *a* ; then you take the bottom earth of the  
 “ trench *b*, and keep putting it into the  
 “ trench *a*, until you have gone to the depth  
 “ of three feet ; then you dig or move the earth  
 “ nine inches deep again at the bottom of the  
 “ trench *b* ; then you take the top earth from  
 “ trench *c*, and lay it on the top of the trench  
 “ *a*. The trench *b* remains empty all this time,  
 “ and you have to toss the top earth of *c* across  
 “ the trench *b*, in order to place it on the top  
 “ of the trench *a*. The trench *a* is now finish-  
 “ ed : it has got the top earth of *c* on its top,  
 “ and all its contents have been completely

Another foot and a half.

“ moved to the depth of three feet nine inches.  
 “ You next take the bottom earth of *c* and turn  
 “ it into the trench *b*; and when you have moved  
 “ or dug the bottom of *c*, in the same manner  
 “ as you did that of *a* and *b*, you take the top  
 “ earth of the trench *d* and put it on the top  
 “ of the trench *b*; and thus you go on until  
 “ you arrive at *A*. When you arrive at *A* you  
 “ will find yourself with an empty trench at  
 “ the end, and with a trench with no top earth  
 “ upon it next to that at the end. You there-  
 “ fore now begin the second strip at *c*. You  
 “ take the top earth of the first, two feet wide,  
 “ and put it upon the top of the trench next  
 “ to the end one of the last strip; you then  
 “ take the bottom earth of the first, two feet  
 “ wide, in this second strip, and put it into the  
 “ bottom of your last trench at *A*; you then  
 “ take the top earth of the second trench at *c*,  
 “ and put it on the last trench at *A*. Thus the  
 “ whole of the first strip is completed, and you  
 “ have again, as you had at *a* and *b*, an empty  
 “ trench at the end, and the trench next to it  
 “ with the top earth taken off. You then pro-  
 “ ceed with the rest of this strip as you did  
 “ with that of the other, until you come to *B*,  
 “ when you turn in at *D*, and do just the same

“ as you did at *c*. You then go on to *e* ; when  
 “ you get there you turn in again at *a*, and  
 “ thus you proceed till you come to *s*, when  
 “ you will find yourself with the last trench  
 “ completely empty, and with the next to  
 “ the last wanting the top earth. These  
 “ are both ready for you. You take the heap  
 “ of bottom earth, which came out of *a*, and  
 “ put it into your empty trench ; then you take  
 “ the heap of top earth which was wheeled  
 “ from *a* and *b*, and lay it on upon the two last  
 “ trenches ; and thus all the ground will have  
 “ been completely moved to three feet nine  
 “ inches deep ; every part of it will have chang-  
 “ ed its place, and you will find it to stand a  
 “ foot or fifteen inches higher than the ground  
 “ in the neighbourhood of it.” The expense  
 of this process will be about double that of or-  
 dinary digging.

In India it would be well to leave a space of  
 about a foot between each of these strips, for  
 the purpose of drainage during the period of  
 the heavy rains, from June to September, when  
 it is desirable to keep the beds of the garden  
 as dry as possible ; these spaces also afford fa-  
 cility of access to the plants on the beds, whe-  
 ther for weeding, gathering, or other purposes.

*Levelling* consists, in gardening, of so spreading abroad the soil as that the surface may be nearly level, (which may be ascertained by the triangular level, plate 2, figure 31,) or at least form an even surface. In India however it is better to form your beds, when these are necessary, so that the middle may be a little more elevated than the sides, and form a slight curve or slope, which may be regulated by the level, plate 2, fig. 28.

*Ridging* is required for some plants, and consists of forming the surface of the ground into a series of triangles, or close ranges of parallel elevations; the best instrument for performing this operation is the spade, (plate 2, fig. 35,) commonly used for digging in England, and too well known to require description, as it makes a smoother cut into the earth, and offers means of flattening down, not to be so well found in the hoe, or *khodal*.

*The operations affecting the surface of the soil*, are surface hoeing, pulverising, sifting, raking, scraping, weeding, sweeping, rolling, beating, and wheeling. *Hoeing* is best effected by the American hoe, plate I. fig. 8, the Dutch hoe, fig. 13, and the pronged hoe, fig. 10; it is performed by dragging or thrusting the hoe along



the surface of the soil so as to cut weeds at, or under the surface, and slightly to pulverise the soil. This is done for four purposes—1st. to loosen weeds so that they may die for want of nourishment, and be gathered off and thrown into the hole for forming vegetable mould; 2d. to stir the soil, for which the pronged hoe would be most useful; 3d. to draw up the soil about the stems of plants; and, 4th. to form a sort of drill or gutter in which to sow seeds; all of which operations would be best performed in dry weather.

*Pulverising* is requisite in this country, from the hardness of the soil, forming itself into clods requiring to be separately broken; the natives employ for this purpose a beater or mallet of wood, or the root of bamboo, and it is found a sufficiently effective instrument.

*Sifting*, or screening, is to separate the coarser from the finer particles of earth, &c.; the materials require to be dry and well broken, and then thrown on the screen or challee, made of thinly split bamboo in a square frame, about five feet by three, if required in large quantities for ground intended for bulbous or other tender and succulent rooted plants, or of circular form, having the rim about three inches

in depth, and the interstices between the split bamboo in this kind not exceeding a fourth of an inch; this is used where a fine mould is required for pots, or to sift lightly over small seeds.

*Raking* is performed by drawing through the surface of the soil the instrument called a rake, plate I. fig. 11, either to pulverise the soil or to collect weeds, or such other extraneous matter as will not pass through the teeth of the instrument; this may be done in larger quantities by the pitch fork, plate I. fig. 12. The earth being nearly at right angles with the handle, the lower the handle is held in performing the operation, the deeper will be the pulverisation. The angle at which the handle of the rake is held depends on the object intended; if only to remove weeds, it should be held higher, but the medium is forty-five degrees. All raking should be done in dry weather, and it will be found often necessary a day or two after sowing seeds, as the soil is apt to cake on the surface, or become what is called *choppered* after watering, and too hard for the young seed to penetrate; the best time for this operation, however, is whilst the soil is somewhat moist but not wet.

*Scraping* is drawing a broad blunt hoe along hard surfaces, as grass plots, or the walks made of broken brick or *khóa*, to remove the subsoil thrown up by worms, &c.

*Weeding* is best and most expeditiously performed with the hoe, especially for the longer weeds, as thistles, &c., when the Dutch hoe is a most useful instrument for the deep rooted short grass; however the native weeder either the *nuranee*, plate I. fig. 19, or the *koorpah*, are good instruments, and suited to the habit natives have of squatting down to every garden operation.

*Sweeping* is used for collecting grass that has been cut, or leaves; for both which purposes the dewy mornings are best fitted, as the leaves or grass then adhere together.

*Rolling* is little resorted to in India, such a thing as a roller, plate 2, figs. 33 & 34, being seldom to be found in a garden, although in England it would be difficult to find one of any extent wanting this useful implement. It is difficult to keep walks or roads in order without it, whence smooth and level paths are seldom to be found in our Indian gardens. It should be drawn over the surface of all walks at least once a week, and produces the best effect

when the ground is dry on the surface, but well saturated with moisture below.

*Beating.* This is made in this country to supersede the last mentioned operation. It is performed sometimes with a small block of wood used in the hand, but more effectually by a beetle or *doormoos*, plate I. fig. 7; being a block of wood of some weight, into the centre of which a bamboo handle is inserted. It is useful for turf or brick walks, as also to make the soil under fruit trees compact and hard, so as to keep in the moisture and check the growth of weeds in such situations; likewise in claying the bottoms and sides of tanks to give them solidity, and prevent the escape of water in those directions.

*Wheeling*, for the carrying materials from one place to another, is little resorted to in this part of the world, where labour is so cheap that few entertain the idea of making a saving in that branch of expenditure, and the article most used for removal of weeds, conveyance of manure, &c. is a small basket carried on the head; it is however a recorded fact, that two men with a wheelbarrow will get through more work in a day than three with baskets.

*The operations on the plants when above*

*the surface of the earth* are thinning, planting, watering, transplanting, pruning, training, and blanching.

*Thinning.* This is necessary with all plants sown broad cast, where they are intended to remain, and especially with carrots, beet, &c. that form long top roots, and in doing it care should be taken to pick out the smaller or less healthy plants ; and in no place to leave any so near to each other as to incommode or draw from each other's strength ; it is a part of gardening generally neglected, and in which all native gardeners require instruction.

*Planting* is of two descriptions—first, as applied to seeds or seed-like roots, as potatoes, bulbs, &c. ; this kind is most frequently done in drills, or separate holes made with the dibber, plate I. fig. 16, into which the seed or bulb is dropped, and then trodden or pressed down, so that every part of it shall be in close contact with the soil, and that no interstices are allowed near it for the accumulation of moisture which is sure to occasion rot ; and this subject deserves the strictest attention, for to its neglect is attributable the great proportion of failures of seed &c. that is found where native gardeners only have the management of a garden. The second

kind of planting applies to plants already originated, and consists of inserting them in the earth to the same depth, and in the same position as they before occupied, care being taken to preserve the fibrous roots as much as possible from injury, distributing them evenly around the stem in contact with fine mould, and to keep the plant upright, as well as that it be not placed deeper in the soil than it was before removal; without this precaution it will be apt to rot at the part where the soil formerly surrounded the stem. Abundant watering is desirable to accompany planting to meet the extra demand made by the mouths of the fibres, as before described, and the best time for planting is either during, or immediately after, the rainy season, on account of the greater profusion of moisture on the ground.

*Watering* is requisite in all stages of vegetation, both for furnishing nutriment, for keeping down insects, and cleansing the leaves: care must be taken however not to wet the leaves during the sunshine, whence the evening is best suited to this operation, whenever requisite, although with people who would be careful not to continue the operation after the rising of the sun, morning would be the

best time, as affording a supply of sap equal to the increased demand made on the plant by the day's heat, and every precaution is necessary in this country to prevent the lodgment of any water in the joints of the leaves or branches, or even on the leaves themselves of the more delicate plants; indeed it may be found best to order your native gardeners, as a general rule, not to wet the leaves at all, as you are sure not to be obeyed to the letter; and you would thus secure some degree of carefulness regarding it. Watering the roots may be done at all hours; for this a flat fan-shaped spout is good (*a* plate 2, fig. 23), if the plants be in rows, as it can be carried below the leaves to convey the water to the root only; a fine rose (*b*) may be used in watering seed beds, the leaves of pines, trees, &c. and the spout alone of the watering pot, (*c*) for giving water to the roots of trees, cauliflowers, &c.

For more extensive irrigation, however, so as to flood the large beds of cabbages, turnips, &c. the most effectual way is to have the garden divided into compartments, and intersected by drains diverging from one common centre, either a well or a reservoir near the tank, to which water may be raised in a very simple

manner, customary in Behar and the Upper Provinces, as shewn in plate 3, fig. 36, *aa* being two posts or supports fixed in the earth, on which rests a cross bar *b*, to this is fixed a bamboo, *c*, having a weight, *d*, at one end, and the cord, *e*, for support of the bucket, *f*, at the other extremity; this the labourer, *g*, pulls down until the bucket is plunged into the water in the well or tahle, *h*, when slackening his hold on the rope the bucket is drawn up by the action of the weight, *d*, and is emptied into the reservoir, *i*, whence the water is distributed by drains through the gardens. Where the ground is extensive, a row of three or more of these machines may be employed to yield a proportionate supply of water. Tilley's metallic garden engine is an useful implement, where the expense of obtaining it from England is not an object.\*

*Transplanting* is the operation of removing plants from one situation to another; this is often done in woody plants to add to the number of fibrous roots, and thus fit young subjects the better for a removal from the places where they have been propagated to those they are destined permanently to fill, but with ve-

\* Vide "Mechanics' Magazine," vol. 27, p. 225



getables it is used to increase the fibrous roots in relation to the larger and more woody ones, so as to add to the size and succulency of the leaves, fruit, or flowers. There are in this operation three things necessary to be attended to—1st. the preparation of the soil to which the plant is to be removed ; 2d. the removal of the plant ; and, 3d. its insertion in the prepared soil.

The preparation of the soil comprises the stirring, loosening, and mixing of the earth with such compost or manure as may be required, according to the character of the plant and nature of the earth, that it is to be removed to. The removal of the plant is to be effected by digging the earth around it, either with the digging hoe or garden trowel, plate I. fig. 15 ; or if the soil be very hard, a spud, fig. 14, and then drawing it out of the soil by hand, taking care not to break or injure the roots ; in some cases the plant may be lifted with balls of earth, containing all its roots, by means of the trowel or of a transplanter, plate 2, fig. 30, formed of two semicircular pieces of iron, or a couple of tiles or khupruls thrust into the ground on each side of the root, and drawn up with it, so as to preserve the ball of earth unbroken round the root, until well fixed in the place to which

the plant is removed. For some large plants or trees it may sometimes be necessary to cut the roots at a certain distance from the plant some time before its removal, in order to create a new supply of fibres to furnish increased nourishment in the new station assigned to it. Insertion of the plant in the place prepared for it, is performed by making an excavation of the size of the roots, either with the dibber, trowel, or the digging hoe, placing the plant in the hole to the same depth as it was previous to its removal; then covering its roots with fine earth firmly pressed to it, (if planted with the dibber, for small plants, this may be done by inserting the instrument at a couple of inches distant in a slanting position so as to pass partially under the roots, and pressing it by an upward movement of the hand towards the plant,) and distributed by pressing the fingers of the hand well between the fibres, so as to leave no interstices for lodgments of water, or to give access to insects; and, lastly, adding water. If the root be removed in a ball, it is well to break away gently the old earth on inserting it into the hole, so as not to leave it caked as it were about the root, and this is the more necessary in diseased plants, especially if the

disease appears to be in the root, when it would be well not to leave a particle of the old earth about it.

Transplanting, when performed to remove plants from one pot to another, is called *shifting*; and this should never be done directly from small to large pots, but always into a size one gradation larger than that in which they were; the reason of which seems to be that in large pots the roots are apt to be chilled and rotted by the retention of more water than is requisite for their well doing. It is to be observed also, that plants generally thrive best in small pots, most probably because the air passes more readily to the roots, through their porous sides, which are nearer to them than in larger pots.

*Pruning* is the cutting off parts of a plant to benefit the remainder, either by promoting growth and bulk; by lessening bulk; by modifying forms; by promoting the formation of blossom buds; by enlarging the fruit; by adjusting the stem or branches; by the renewal of decayed plants or trees; or by the removal of diseases. The instruments requisite are a sharp knife, a bill, plate I. fig. 17, for lopping the branches of hard trees, a saw for fruit

trees, or a sickle or husswa, plate I. fig. 18, for lesser branches. 1st. Pruning to promote growth and bulk is seldom requisite in this country, where the rapidity of vegetation is already rendered too great by the heat, save so far as it may tend to infuse strength into the stronger branches by removal of the weak side shoots; besides cutting off the weak shoots, the strong ones should be shortened, in order to produce three or four, instead of one; in general, bulk being the object, upright shoots are encouraged rather than lateral ones, except in trees that are trained, where shoots should be encouraged at various angles. In old trees, this object is promoted by the removal of the dead or already scaling off outer bark.

2d. Pruning to lessen bulk is an unnatural process, which if persisted in, renders a tree knotty and unsightly, and in stone fruit trees is apt to produce canker and gum; it is only necessary where trees are crooked or too close to the walks, and then it is better to remove them.

3d. Pruning to modify the form of a tree.—Where trees are planted for shade or shelter, as also in avenues and some hedge rows, it is

desirable that the lowest branches should be at some distance from the ground ; in the first, that room may be given to pass under them, and in hedge rows that they may not harbour snakes and other vermin. The shoots are to be cut off cleanly near a bud, if it be intended only to shorten them, but if altogether removed, it should be done as near to the stem as possible, to assist the healing and growing of the bark over the wound. In pruning fruit trees, the chief object is to assist or increase their bearing ; where this is done on standards, or such as are allowed to assume a natural form in an open space, no shoot of the young plant should be permitted to take the lead, but a number must be encouraged to radiate upwards from the graft, and kept as regular in distance as possible ; but at the same time scope should be given to the natural form of the tree, which has generally a tendency to a cone, the operations of the ~~former~~<sup>latter</sup> being chiefly directed to thinning out the weak and crowded shoots, and preserving the balance of the tree, by taking care that an equal portion of branches be allowed on each side, allowing the light to penetrate into the tree on every side, but having no interstices through it.

4th. Pruning to promote the formation of blossom buds, depends in a great measure on the description of the tree to be operated upon. The mango and leechée, for instance, produce their blossoms from the extremities of the last year's shoots, whence a sufficient proportion of these should be preserved when these trees are submitted to the pruning knife; whilst the peach requires a regular distribution of young wood to be preserved, as it produces its fruit on the preceding year's wood; and in the plum the blossoms proceed from short leafy protuberances called spurs; whence in these last the production of blossom buds is promoted by cutting out weak wood to strengthen what is left. The rose, and many other shrubs, have their blossoms on the wood of the current year, and pruning should therefore remove both new and old wood, if it have once yielded. Pruning ~~its~~ blossoms to enlarge the fruit, is performed by diminishing or shortening the blossom bearing branches, so as to add to their strength.

Pruning for adjustment of the stem or branches, is analogous to that intended to modify its form, applying chiefly to trees just transplanted, or those that are very young; and in the

former it may be properly done in the process of removal, whilst the plant is yet out of the earth.

5th. Pruning to renew old or decayed trees, is chiefly of use when it is desired to preserve a fruit of superior flavour, the tree bearing which has become exhausted by age; and this is done by cutting down the stem to within a foot or two of the surface of the ground, or sometimes only to the top of their stems.

Pruning for removal of disease, may be done by cutting off whole branches, the entire head, single shoots, or merely the diseased portion of the wood or bark; but in doing this, care must be taken to cut away the whole of the part affected, and even a portion of the surrounding wood or bark that is sound, so as to be certain that all contamination is effectually taken away.

6th. Pruning is sometimes applied to the roots to remove decayed portions, when the roots are laid bare, as in fruit trees, at the close of the rains, or when parts of the root are bruised and injured in the process of transplanting, to facilitate the healing of such portions by making a cleaner and smoother wound. Also in removing fruit trees it is sometimes well to

follows :—at the end of the first season after the graft or plant has been put into the ground, the side branches are fixed at an elevated angle, to encourage the throwing out side shoots, the stem being maintained in an erect position ; the second season in this country will complete the growth necessary for training, when the side shoots must be shortened, and all superfluous branches removed, the required shoots being fixed to their proper positions by shreds or rope ; but if the latter, pieces of old leather should be placed over the branches before they are tied to preserve them from friction.

*Herbaceous training* is performed in various ways. Plants that twine of themselves, such as the convolvulus, should be furnished with poles proportionate to their height, whilst those that are furnished with tendrils, as the pea, &c. require sticks with sprays—the small lateral branches of the bamboo answer well for these—that the plant springing up through them may attach itself by its tendrils. Props or supports are necessary for upright, tall, slender growing plants, such as the dahlia ; whilst creeping and trailing plants, such as the melon, cucumber, &c. are trained on the



ground, or on a low platform, in a star-shaped form, by means of pegs.

*Blanching* is the art of whitening certain plants by the exclusion of light, and is performed in various ways, as the kind of plant directs.

By earthing, as performed on asparagus, celery, &c.;—in the latter, being an annual, by drawing up the earth in ridges, so as to press on, and lay close to the leaves as they grow; and in the former, being a perennial plant, by covering it over with loose earth through which the young stalks shoot up.

By tying the leaves together, as performed on lettuce;—the plant being in its most leafy state, the heads of the leaves are gathered together and tied round with plantain fibres, whereby the centre, or heart, becomes more solid and tender, and the inner leaves, being excluded from the light, are blanched.

By overlaying with tiles or pieces of board, when nearly full grown, as performed on endive, and other salad; but the next mode is to be preferred:

By covering with blanching pots of a bell shape, or flower pots reversed: this acts successfully on endive, asparagus, &c.

## OPERATIONS FOR INCREASING FRUITFULNESS.

These are sometimes called for in India, as the rapid vegetation induced by the heat often prevents trees from blossoming, or makes them barren of fruit. Various means have been adopted to remedy this evil, and among the most successful is, after the annual pruning of the branches, to lay bare the roots, and keep them exposed to the action of the air and the dew, until the leaf buds begin to burst; a process that is suitable to almost every description of tree; some also cut the roots before filling in the earth around them, with the view of preventing their absorbing so much sap, and hence checking the growth of useless wood. For the like purpose ringing is resorted to; this is performed by cutting out a ring of outer and inner bark round the stem with a sharp knife, not larger than a stone fruit tree can fill up in one, or a kernel fruit tree in two seasons; this may be done with two objects, either to cause increased production, or to increase the size and accelerate the ripening of the fruit; if for the latter purpose, it should be done when the plants are in blossom, and it will shew its effects the same season; but if to increase production,

ringing must be performed in the spring, and its effects will be produced in the following year.

A renewal of soil about the roots, especially of peaches or figs, will renew or increase fruitfulness, if conducted with reference to the state of the plants; thus, if the trees are weakly and unthriving, changing the soil about them for a rich, loamy, well manured earth, or if the too great luxuriance indicate that the existing soil be too rich, a poor limey soil mixed with sand must be applied. Bending down the branches, by stagnating and checking the too free circulation of the sap, will conduce also to fruitfulness.

#### OPERATIONS FOR ACCELERATING OR RETARDING VEGETATION.

*Acceleration* is little called for in India, but the easiest mode of effecting it is by manures of a hot or stimulating nature, such as pigeon dung for cucumbers, blood for vines, &c., or by adding lime, rubbish, or sand to stiff soils to make them more porous, and give free access to moisture, which must be liberally given. At-

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tention also to select for such sowings as you wish to produce an early crop, seeds that have been the first to ripen in the previous year, will accelerate vegetation considerably, as will also the sowing them on a hot bed, which last also has a good effect on scarce seeds that may have been long kept, and in Europe hot houses and other expedients are made use of with exotic plants to imitate warm climates. *Retarding*, a less easy process, may be effected in the early part or spring of the year, by forming beds in an east and west direction, with a considerable slope towards the north, on which salading, spinach, and turnips may be sown with less fear of their shooting up into flower stems than if sown in beds of the ordinary description. Placing a shade either over, or on the south side of growing plants, allowing at the same time a free circulation of air, will have the effect of checking or keeping back their vegetative powers.

## DESTRUCTIVE ANIMALS, ETC.

It need hardly be said that the garden must be protected from the incursion of the larger of these by strong fences, but still there are some that these are no protection against; such are hares doing extensive injury to fruit plantations (where this creature abounds) by gnawing the bark, therefore, the part of the stem within their reach should be smeared with cow dung or tar, occasionally renewed; field mice and rats, by burrowing under shrubs and destroying the roots, or eating the root of tuberous plants, do an infinity of mischief, and perhaps the best mode of destroying them is to smoke them in their holes; this may be easily done by filling a native water jar, or kulsee, with dry straw or leaves, and turning the mouth down on the hole, closing every orifice perfectly; then perforating the upper or bottom side and setting fire to the straw within, blowing occasionally through a hollow bamboo at the perforation to drive the smoke as much as possible into the hole. Squirrels and flying foxes are very destructive to fruit, and the former to young plants also, but are only to be overcome by killing them, as also are the birds,

especially parrots and pea fowl, the former to fruit and maize, and the latter to young growing plants.

#### DESTRUCTIVE INSECTS.

These are the worst enemies we have, and their species are so numerous that it is difficult to obtain a correct knowledge of their habits and economy, so as to oppose their devastations with any prospect of success; this work can only attempt to give a few of their names. All insects in their larvæ, or caterpillar state, feed most voraciously, and the gardener's eyes must be ever open to discover where they are at work; in a short time every particle of vegetation within their reach will have disappeared. Of these a few of the most destructive may be worth noticing.

*Butterflies and their larvæ, or caterpillars.*  
The swallow-tailed butterfly. The caterpillar is green, having a black band at each division, and relieved by small round redish coloured spots: it does little injury, confining its feeding to the carrot or fennel leaves.



The cabbage butterfly, of a greenish white. The caterpillar is of a greenish yellow, irregularly marked with black spots in the larger kind, and of a delicate green, with small yellow rings on each side of its body, in the smaller description; these two cause great destruction among the cabbage beds, frequently getting into and hiding themselves in the hearts of cabbages and cauliflowers.

The white butterfly, with green veins, is also a great pest; the caterpillar is green, with orange stripes, and infests the turnip and the radish.

The hawk moth, of which some species are found here, has a green caterpillar with pale coloured or white stripes: it feeds chiefly on the young and tender shoots of trees and shrubs.

Moths, the caterpillars of which are hairy, are extremely destructive to lettuces, marjoram, parsley, geraniums, &c.

Plant lice, or green flies, are most destructive insects; almost every plant is subject to their attacks, and they vary according to the description of vegetable they feed on; maintaining however always the form of the small leaf buds from which they are hardly distinguishable, and hence only observable on minute exami-

nation of the plant ; their fecundity is so enormous, that it has been calculated that nearly a million may be produced in three generations ; they fortunately find many enemies, all classes of birds feeding on them, as well as many insects of the beetle kind.

Plant bugs are almost as destructive as the preceding, and are concealed by their resemblance in form and colour to the scales that occur on the bark of the trees on which they feed. Another kind appear like little spots of white cotton, and attack many trees, but especially the vine, and those of the plum kind.

Weevils, most of them very small, live upon seeds and vegetables, and do vast destruction, especially in the former, by destroying the germ.

Grasshoppers and locusts of various sizes abound, and commit extensive depredations in the garden.

Flies, the small maggot, that is the larvæ of the various species, are nearly all destructive to vegetable life and growth ; one kind attacking radishes, another the cauliflower, another the onion.

Spiders, of various kinds abound in our gar-

dens, especially those of the red and yellow descriptions ; there are several kinds of the former seeking their food on the pine-apple, the vine, the rose, &c. ; one sort conceals itself in a frothy substance like spittle, and frequents most kinds of shrubs, especially the rose ; centipedes of various kinds do injury to the roots of carrots, turnips, &c.

Ants of numerous kinds meet the view at every turn ; of these the most destructive is the white ant, insidiously destroying the roots of fruit trees, and the red ant that attacks almost every thing that comes in its way, fruit, the roots of turnips, radishes, and so forth. The destruction of all these insects is only to be accomplished by patiently watching the progress and habits of each, so as to learn the fittest time to destroy them ; lime is of effect with many kinds ; pounded turmeric is offensive to ants of most descriptions, but boiling water is their only destroyer, and that should be poured into their holes until they are all destroyed or quit the spot ; with the small red ant this is most easily ascertained, as they bring out the dead insects, and place them in a heap near their holes as long as any remain alive to perform that operation ; whence it is easy to con-

clude that when no more dead are brought out, the nest is destroyed. For caterpillars and most other larvæ, hand picking is the only sure mode of destruction.

#### THE GARDEN.

A garden will be considered to consist of a combination of that part appropriated to culinary vegetables, or the kitchen garden, of the fruit garden, of the shrubbery, or garden of ornamental trees, and of the flower garden, united together in one spot of ground, but so divided into compartments that each portion may be kept distinct, and in like manner the plants in each will be distinctly described ; commencing with the,

#### **Kitchen Garden.**

In laying out ground for this purpose, care should be taken not to place it adjoining to the house, as such an arrangement would be unsightly ; at the same time it should not be at such a distance as to place it beyond the reach of constant supervision or easy access ; above

all it should have the command of a plentiful supply of water, and be well fenced in, for it is always better to secure your garden from temptation, by preventing general access of servants or strangers, than to rely on punishment of individuals after you have been robbed, as a prevention from loss. It need not be added, that its extent must entirely depend on the wants of the owner, and no rule can be given for this, remembering however that the preferable evil is, to have a little too much ground, rather than be cramped for room, or have to overwork any part of it by the too frequent cropping of the same spot, or to run the chance of not having space sufficient to afford a due observation of the rotation of crops.

The component parts of all culinary vegetables are starch, gluten, sugar, and fibre, and of these the most nutritive is the first; contained in the largest proportion in esculent roots of various kinds.

It is not easy to separate our vegetable productions into distinct classes, as many of them approach each other so nearly and gradually as to belong to more than one. Most kinds are raised only by seed, of which the best comes from New South Wales; the next to this is

procurable from the Cape of Good Hope, because the voyage from England is too long to expect the seed to preserve its full vigour in the manner in which it is generally packed : some that has been sent from France in bottles closely sealed down, has reached India however in very great perfection. American seed, especially of turnip and beet, as well as of the cucumber and gourd kind, and the tomato is often found very good ; great attention is necessary to these particulars, as nothing is more disappointing, after you have taken every pains to secure a good supply of vegetables, than to find all your hopes frustrated by the seed you have made use of, being bad either in quality or kind.

*Brassica, or the Cabbage Tribe.*

The leaves and unexpanded flowers of this class of vegetables, are eaten boiled or made into a pickle, and it is too generally known to need a particular description.

*White Cabbage.* In this the object of culture is to produce close, firm, and compact heads, green externally, but within white and mild in

flavour; the young plants being sometimes eaten as greens, before the head forms.

*Early York* and *early Battersea Cabbage* are the most delicate in flavor and well worthy more attention than has hitherto been paid to them. They may be sown in pots, under shelter, during the rains, in the beginning of August, but little time is gained to the crop by beginning so early, as plants sown at this period will not anticipate those put in at the end of the month, or the beginning of September, by above a few days. The sowings may be continued till the end of October, at intervals of fourteen days, by which means a supply may be continued until the end of February; they will take about four or five days to come up, and should be pricked out about a fortnight after, and finally transplanted, at a foot and a half distant, in the place where they are to become perfect, in about another month; being fit to cut in three months from the time of sowing.

*Sugar-loaf Cabbage* is a larger and less delicate kind, forming very white hearts, and may be sown the same time as the last description, but take a longer period to come to perfection, being seldom fit to cut under four or four and a half months, half of which time

they should be in the spot for perfecting, and planted not less than two feet apart; a continuous supply may be kept up by sowing at intervals until as late as the middle of November, which will yield a late crop in the middle of March.

*Drumhead Cabbage.* This, though the most usual cabbage of our bazars, is of a very coarse and strong flavour, used in England chiefly as a field cabbage for feeding cattle; it may be found sometimes at eighteen inches diameter within the outside leaves. The sowing of this should take place at the same time as the before mentioned, and it requires between four and five months before it is fit to cut, and to be transplanted at full three feet apart.

*Savoy* is distinguished from the other close hearted cabbages by its wrinkled leaves. The globe and the dwarf green savoy are the best kinds for this country, as they soonest come to perfection, and do not so much feel the want of the frost they are accustomed to have in Europe, where it is a common belief that a hard frost is indispensable to the perfecting of their flavour. If sown at the same time as the other cabbages, and planted out at about two feet apart, they will be fit for the table in



December and January ; but they are apt to form a long stem, and become reduced, in consequence, in the size of the head, sometimes dwindling, if not taken care of, and plentifully supplied with moisture, to three or four inches in diameter.

*Red Cabbage*, used chiefly for pickling, is nevertheless a very nice vegetable stewed, the best sort being the red Dutch. If sown towards the end of September, and transplanted into good soil about a month afterwards, after two previous removals to strengthen and fill out, the stem will give good firm heads about the middle of February.

*Propagation* of all the above descriptions of cabbage are the same, by seed raised annually, which should not be scattered too thickly.

*Soil, &c.* The soil should be light, and except for the early sowings in August, not rich. It requires an open situation, and when transplanted should have a rich, highly manured mould, rather clayey than sandy, as it is a very exhausting crop ; in this operation care must be taken to keep each kind distinct, as also to press the earth well up to the root fibres by a sloping insertion of the dibber, as before described ; and the best way is to

plant it in small trenches, branching from the water drain at right angles, so that a large supply of moisture may be readily given at its roots as soon as it begins to form heart, when too much water can hardly be bestowed; at the same time too the earth should be drawn up about the stem to give support to the superior weight, and preserve its erect position; all that fail, or shew a tendency to run up to flower should be immediately pulled up. If some of the stems of the larger sorts are left on the ground, they will afford a supply of good sprouts for several months, when other vegetables are hardly procurable.

*Borecole*, or *Kale* as it is more commonly called, comprehends many varieties, all however distinguished by having a somewhat large open head of curled leaves, as well as being exceedingly hardy, giving sprouts during the greater part of the year, and lasting several seasons.

*Objects of culture*, to keep up a large succession of fresh curled sprouts.

The *German*, or *Scotch Kale* as it is called, and the *purple Kale*, are the best sorts; they may be sown at almost any period of the year; perhaps the end of June is the best time; the

young seed leaves appear in seven or eight days, and in a fortnight after they may be pricked out, and then transplanted to the place they should occupy in about a month after, when they will give a crop about the end of September.

*Propagation, soil, &c.* The same mode of proceeding, should be pursued as with the larger sorts of cabbage; but they may also be propagated by cuttings.

*Brussels Sprouts* are little known in India; they produce a long stem, often three feet or more in height, the top resembling a savoy planted late in the season, and from the joints of the leaves shoots sprout out, forming small close miniature cabbages, which make a delicious vegetable at a time when others are going out; they are extremely prolific, renewing the supply of small shoots almost as fast as they are removed, and may, by judicious sowing, be made to continue their supply nearly to the commencement of the periodical rains.

*Propagation, soil, &c.* This plant is raised from seed, which should not be sown too thick; after a shower of rain is the best time for so doing, and in the beginning of November they

will shew their seed leaves in three or four days, be fit to prick out in about twenty or five and twenty, and ready for final transplanting in the beginning of January, in beds at about eighteen inches apart, as they do not spread much in width, and the side leaves soon drop off. They require the same description of culture as all others of the cabbage tribe, and a plentiful supply of moisture; the crop will be fit for the table in the beginning of March.

*Cauliflower* is the most delicate of the cabbage tribe, the eatable part being the young flower buds, forming a close firm and white cluster. There are only two varieties, the early, having a head of only about four inches diameter, and the late, growing to a large size.

*Propagation.* Some people consider that an early crop may be secured in dry situations by sowing in February or March, and shifting the plants during the rains; the success however of such a proceeding is doubtful; and as the seed is generally scarce, from the great demand for it by all classes, it would be best not to run the risk of such an experiment, but be content with sowing the early seed in the middle of August, in pots under shelter, when

they will show their seed leaves generally in three or four days; these may be pricked out about the middle of September, and transplanted at the end of October, giving an early crop in the end of November or beginning of December. The larger kind may be sown any time from the beginning of September to the end of October, and will show themselves in three or four days; they should be pricked out to a light soil when three inches high, and in about a month after, say from the beginning of November to the middle of December, they should be finally transplanted into holes of six inches in depth and at three feet apart: this is advisable, that the supply of water may be sufficiently given, and the roots never allowed to get dry. As soon as the flower begins to form, these holes should be filled with water morning and evening; if instead of water, liquid manure is procurable for one of these waterings, so much the better, and at this time the larger leaves should be turned down over the heads to defend them from the sun and dew, and to preserve them white and close; about a month or six weeks from the time of their being transplanted will suffice to make them fit to cut.

*Soil.* The soil for the seed bed should be light, but when transplanted the mould cannot well be too rich; strong stable manure should therefore be liberally supplied to the roots.

*Broccoli* has seldom succeeded in India, and the seed rarely reaches sufficiently fresh for culture except from New South Wales. The whole treatment and culture is the same as for the cauliflower, but some are of opinion that they need not be transplanted, but that it will suffice to let them remain where pricked out, only thinning away the weak plants, to afford more room for the rest.

*Insects* affecting the cabbage tribe are chiefly of the caterpillar kind; guinea fowls are good destroyers of these, which must otherwise be picked off by hand. The worm, centipede, and weevil sometimes attack their roots, and a small black kind of plant bug covers and destroys the leaves of weak plants; these last wood ashes are the best means of destroying, but if discovered before many are attacked, it would be better to pull up the infected plants.

*Diseases.* The principal is called the club in the root; this is a large tubercle or swelling, caused by the larvæ of a kind of weevil called

commonly the *grub* ; frequent transplanting palliates this disease, by promoting the growth of fibrous roots, but the only actual cure is cutting out the diseased part carefully.

### *Leguminous Plants.*

The fruit is eaten boiled, either enclosed in the pod when tender, or the seeds taken out or shelled.

The *Pea* is too well known and esteemed to require description ; the object of culture is to produce a full pod, and at the same time to preserve the skin tender and the flavour sweet. When dry they contain about forty-six parts of fibre, the remaining half being nearly equally divided into sugar and gluten, whilst fifty parts are starch ; but when green the sugar exceeds the starch in quantity. There are two principal divisions or kinds ; the dwarf, generally also the early pea, and the tall.

*Early Dwarf Pea.* Of these the earliest is the early Warwick, and takes somewhat less than a month from the time of sowing to its being fit for the table. If sown in a sheltered and elevated spot in the garden, a very early

crop may be put in as soon as the middle of August, giving a supply for the middle of September; but this will only be worth trying when you have an abundant supply of seed. A sure early frame crop, growing  $2\frac{1}{2}$  feet high, may however be sown about the middle of October, which will come in in the middle of November, whence it is easy, by sowing every tenth day after the middle of October to keep up a regular supply.

*The Early Washington* from America is a very superior flavoured pea, and takes about six weeks to fit it for the table; if therefore it be sown at the same time as the last mentioned kind, it will form a good succession to it; it is about three feet high.

*The Dwarf Prussian* might, if sown at the same time, form a further succession, as it requires two months; it grows from three to four feet in height.

*Knight's Dwarf* is a good pea for a late crop, growing some three feet high, and if put in the ground towards the middle of December will begin giving its crop in February, and continue through the greater part of March, as it stands the heat of that period better than any other kind of pea yet tried here. It has a small, but



full pod of sweet flavoured peas, and is a most prolific bearer, one plant yielding as much as half a dozen of most other kinds.

*Tall Marrow-fat Pea* is a very fine growing plant, giving full pods and a tender seed; it grows often nine or ten feet in height; this requires nine or ten weeks to give a crop, and if required for the end of December, must therefore be put in the ground about the middle of October; the best time however, if quality be studied, is the end of that month, which will give a fine January crop; the sowing may be continued every fortnight till the middle of December, whereby a supply may be secured to as late a period as the middle of April, provided care be taken in watering.

*Imperial Blue* takes a somewhat longer time in coming to perfection, but yields a very large sized and good flavoured pea; if sown in the middle of November it will give a good crop by the end of January; it grows some eight feet high in good ground.

*Green Marrow*, and *Green Scymetre*, the latter a delicious pea, may be sown in the end of November and will give a crop in the beginning of January, and are sweet and tender, not growing so high however as the other tall kinds.

*Native Peas* may be sown, if desired, about the same time as the dwarf sorts, but they are tough skinned and deficient in flavour.

*Propagation* of peas is only by seed, a pint of the smaller sorts being the proper quantity for a row of twenty yards, whilst of the tall kinds the same quantity may be extended through thirty-five yards. For the early sorts, make the drills an inch and a half deep, and about three to four feet asunder ; but in sowing the tall descriptions of pea, the drills must be two inches deep, and from four to six feet apart.

*Soil, &c.* The soil for peas ought to be moderately rich, manured with fresh sandy loam, with decayed vegetable matter to some depth for the larger sorts, but fresh un-reduced dung is liable to hurt them. As the plants reach two to three inches in height, the earth should be drawn up to the stems, earthing gradually higher as they ascend, and shading them if the sun be hot, when from six to twelve inches high ; as they throw out tendrils stick them with well branched sticks—the loppings or side branches of bamboos are very good for the purpose—of a height proportional to the description of pea, putting them in on the most sunny side, that the action of the sun

may incline the plants towards them. Topping the leading shoot when the second or third set of blossoms appear, will accelerate the setting, and promote the filling of the pod.

*Garden Beans* contain similar proportions of starch, &c., to peas, but a rather less quantity of sugar. They are an annual plant, rising from two to four feet in height. The seeds are either boiled separately or in soup. There are two principal varieties, the early and the late; of these the *Mazagon* among the former, and the *Windsor* among the latter, are the best sorts.

*Mazagon Bean* is small, good flavoured, and hardy; these should be sown in the middle of October, taking advantage if possible of a shower, and they will then yield a good crop towards the end of January; this kind is an abundant bearer.

*Windsor Bean* is large, and, when gathered young, sweet and agreeable in flavour; they do not bear plentifully. The middle of November is the best time for sowing them, and they will then begin to blossom about the middle of January, and about the twentieth of February yield a good crop.

*Propagation* is carried on by seed, of which

a pint of the smaller sorts will be required for eighty feet of row, the like quantity of the larger kinds serving for a hundred and twenty feet ; the smaller being put in drills, two and a half feet apart, at a depth of two inches, and about three inches apart in the row. For the larger sorts, the rows may be three feet distant from each other, put in three inches deep, and four inches apart in the row ; they should have the earth well trodden down before covering in. Some prefer to soak the seeds for about three hours before sowing them.

. *Soil, &c.* A stiff heavy clay is the best soil for beans, and as the plants spring up from two to four inches in height, the earth must be hoed up to the stems, taking care however that no earth fall into the centre of the plants to bury them, as that would occasion rot. As the plants come into full blossom, or just as the first flowers fade, the tops should be pinched off, to promote the produce of well filled pods.

*Kidney Bean, or French Bean* as it is more commonly called, the unripe pods of which form a well known vegetable, needs little description, as few tables are without them ; they also make a good pickle. The pods as eaten contain more sugar than starch in the young

beans, and some sugar with a larger quantity of fibre in the pod ; they are considered wholesome and nutritive. Of these there are two kinds, the dwarf and the climbing.

*The Dwarf Kidney Bean* is esteemed the most delicate in flavour, the early white being the best ; they take about two months from the time of sowing before they yield fruit fit for the table, and in about three months more will ripen their seed. They may be sown any time from the beginning of August to the end of December. Although it is not usual in England to stick this kind of kidney bean, it will be found better to do so in this country.

*The Scarlet Runner* is a tall climber, the pod of coarser flavour than the preceding, and takes three and a half months from the time of sowing before it is fit to gather, and then requires another month to ripen the seed ; it may be sown any time from the beginning of October to December.

*The Yellow Canada Bean.* This is one of the tall varieties, the seed of which is brought from the Cape ; it may be treated as the foregoing ; the seed also forms a delicate article for the table.

*The Lima Bean* is rarely met with, but the

seed forms an extremely delicate article for the table, and is highly esteemed in the West Indies, as well as by all who have had the good fortune to meet with it; it is a tall climber, and if sown in October, gives a crop in February.

*Propagation* of these is entirely by seed, of which a pint is sufficient for a row of eighty feet, letting the rows be full four feet asunder, and the seed put in a depth of three inches.

*Soil, &c.* The soil for all kinds should be light, and but moderately moist; they should be earthed up and stuck in the same manner as peas.

*The Long Bean, or Dolichos*, for many years supposed to belong to the same class as the kidney bean, is peculiar to warm climates, and many species of it are to be found growing wild in India; there are several varieties of it cultivated—the best are,

1. *Mukun Seem*, sown in May or June, and giving produce in February.

2. *Brazilian Pea*, sown, and yielding produce at about the same periods.

3. *Pertab Sing's Bean* is of very large size, and cut up forms a tolerable representative of the kidney bean. Sown in the latter end of May, it gives produce towards the close of July.

4. *Assam Bean* is but recently introduced as an article of food, though it grows wild in great abundance in the hills and their neighbourhood ; it possesses the advantage of coming in season when other vegetables are scarce ; the seeds only are eaten, boiled like garden beans, which they much resemble in taste ; they ought to be gathered young, or if left, the skins must be taken off before they are brought to table. It should be sown in the beginning of June, and will come up in a few days, and be fit to gather in the middle of September.

5. *Black Bean*, or *Pois Noir* of the Mauritius, is of yet more recent introduction ; may be used as the last kind, over which it possesses the advantage of the pod not being covered with the light prickles or cowage that coat the Assam bean ; it is also a fine food for cattle.

6. *The Winged Pea*, though belonging to a different tribe known among botanists as *tetragonolobus edulis*, may be included under the present head, from being used in the same manner ; it may be sown in the month of May, and will yield its produce about August.

*Propagation, soil, &c.* These are all grown from seed, and require a tolerable rich soil, in which the plants grow to a very large size.

*Insects.* All the leguminous plants are liable to attacks from the plant louse, those on the pea being green, and such as attack the bean commonly black; these can only be successfully opposed by taking off the shoots on which they are found, and destroying the insects by fire or otherwise, at a distance. A beetle or weevil often gets into the pods and deposits its egg in the seed. The caterpillars too, frequently destroy the leaves.

### *Esculent Roots.*

The esculent rooted plants generally delight in a deeply dug, light, sandy, and well cultivated soil, the better kinds requiring a dry subsoil and moderate temperature, from want of which two last qualities these descriptions of vegetables seldom reach that perfection in India, that they attain in Europe.

*Potatoe.* This is the most useful and generally known of this class of vegetables; when mealy one-thousand parts are found to contain two hundred of starch, forty of gluten, and twenty of sugar, the remainder being fibre. There are upwards of thirty different varieties, few of which are known or ever at-



tended to here. They are generally procurable of sufficient good quality in the bazar at all times of the year, and hence in a small garden it is not worth while to attempt rearing them, unless indeed you desire small crops of very early new potatoes.

*Propagation.* This may be done by seed, but this mode is never resorted to except with the view of obtaining new varieties; planting out portions of the tubers containing each two or three eyes is the best, and most general method pursued; but with reference to its adoption in India, Mr. J. W. Masters, in an article read at a meeting of the Horticultural Society in Calcutta, says "So far as my experience goes, "a potatoe of a moderate size, having three or "four good eyes, is far better than a part of a "large one, and generally produces a better "crop." In planting sets it is worthy of observation that those near the top end have been found to come to maturity much earlier than those from the root end of the potatoe; the proper time is September and October. They should be put in drills about two feet distant, and from eight to twelve inches apart, being covered with earth about three inches in depth.

*Soil, &c.* The best is a light, fresh, unmixed loam, wherein they will thrive without any manure, and in such land they will always possess the best flavour. In a wet soil the potatoe gets sickly and watery, as well as being infested with insects and worms; manure gives a disagreeable flavour to the root, and although littersy dung will produce the earliest and largest crop, those cultivated in soil tempered with old mellow dung, rotten leaves, or vegetable mould, are on this account most esteemed. After the plants have appeared, a deep hoeing with the pronged hoe should be given, and when they reach about six inches in height, bring up the earth around them to strengthen their growth, and promote increase below. Frequent hoeing should then be resorted to, to eradicate all weeds, until the plants spread sufficiently to be able themselves to keep them down, only pinching off the blossoms when they appear, to increase the crop. The drying up of the stalks, or holm as it is called, is a sign that the crop is fit to take up, and this is best done with the pronged digging hoe, which is less liable to injure the tubers than the flat kind. The holm makes a good manure.

*Insects and diseases.* The red worm and

the grub are the most injurious insects, but these may be remedied by mixing a small portion of lime with the soil; but as an excess of this would injure the potatoe, a frequent change of soil and not cultivating the same spot with this vegetable two years in succession, is the only sure preventive. The *curl* is a disease common to potatoes, and is by some supposed to arise from the tubers whence the sets have been taken having been exhausted by over ripening, whilst others believe it to arise from a grub in the roots.

*Jerusalem Artichoke* is a species of sunflower, growing often to ten or twelve feet in height; it bears on its roots large clusters of round tubers, something like potatoes, which are sweet and pulpy, containing a large portion of sugar, whence they form a nourishing and wholesome food, and were formerly, before the introduction of the potatoe, in very high esteem. If planted in rows from east to west, they will afford an useful shade to such plants as require it in the hot weather.

*Propagation* is best performed by planting sets or cuttings of the roots in rows, eighteen inches or two feet apart, inserting them from four to five inches deep in the soil.

*Soil, &c.* They will thrive in almost any soil, but are apt to degenerate if continued too long in the same ground ; the best way therefore to secure a continuance of good roots is to take them up every cold season and re-plant them in fresh soil ; this is the more advisable as they multiply so fast, that it is not easy to clear the ground of them when they have once established themselves in a spot ; on this account also it is necessary in taking them up to be very careful to clear out every particle of root. The earth, if a large sized tube be desired, should be kept clear of weeds, and ought to be brought up round the stems occasionally.

*The Turnip* needs no description, as the use of the root is familiar every where. It is a nourishing and wholesome article of food, containing seven parts of starch, and one of gluten, with a large portion of nitrogen and water, out of the thousand. The tops or young leaves form a pleasant vegetable boiled as greens. In estimation of sorts, the first place, both as respects tenderness and flavour, must be given to the *American flat Winter Turnip*, of which Cobbett observes most justly, it is “ the finest turnip I ever tasted.” They grow to above four inches

in diameter, but are never more than an inch and a half to two inches in thickness, with a fine tap root springing from the centre. They should not be sown till the beginning of November, when they will be fit to pull early in January. They will be best if transplanted, rejecting all the weak or sickly plants, as indeed is the case with turnips generally in this country.

*The early Dutch*, the *early Stone*, and the *Globe*, are the next best sorts, and if English seed be used, will be found to give the finest flavour if sown from the middle to the end of November; they require about two months and a half to be fit to pull.

*The Botán* is a good flavoured turnip, of a yellow colour, and if left to come to perfection in the spot where sown, will be ready in five or six weeks.

*The Swedish Turnip* is coarse and strong flavoured, often growing to a very large size, and affording fine wholesome food for cattle, but should not have a place at the table.

*Propagation* is wholly by seed. If to be left where sown, a bed of four feet broad by twenty-eight in length, will require half an ounce of seed, but of course it may be sown much closer should the intention be to trans-

plant. If the ground be dry, the seed should be well trodden down before covering with earth, and this should be lightly sifted over to a depth of about an inch and a half. For an early crop the sowing may be made towards the end of August, or beginning of September, at which time it will often begin to put forth the seed leaves, within twenty-four hours; these will yield a crop by the end of October; the sowings for late crops may be continued until January.

*Soil, &c.* The turnip requires a light, rich soil, well broken by cultivation; if a small portion of sand exist it is to be preferred, and should dung be requisite, it must not be fresh, or it will afford a shelter and encouragement to the fly; a plentiful supply of moisture is requisite during the whole period of growth. As soon as the young leaves are about an inch broad, the plants may be transplanted, if such be intended, or if left to grow, they should be thinned out to about six or eight inches distant from each other; and as the root increases in size, a few should be pulled so as to thin the remainder out to some ten or twelve inches apart, which should be the space allotted them in transplanting, when-

ever that course is pursued; a good supply of water should be given daily.

*Insects, &c.* The most injurious of these is a kind of beetle commonly called the fly, which commences its attacks as soon as the seed leaves appear above ground: the best cure is to be found in scattering quick lime over the plants, renewing it should a shower of rain fall before the rough leaves appear, when it is out of all danger from this insect. It is however then attacked by a weevil, the grub of which often makes all the leaves complete skeletons, and by a species of cricket that burrows in the earth, and cutting off the leaves from the stalk drags them to his hole. As soon as the leaves get larger they are attacked by the green caterpillar; and when the root has formed, it becomes the prey of the red ant, that eating off the outer skin gives admission to the water, which causes the inside to rot, or affords room to a species of weevil to obtain entrance, and deposit its grub.

*Turnip-rooted Cabbage, or Knole-Kole,* is perhaps not fitly named, as the bulb or excrescence, whence the name is derived, is not on the root, but forms a sort of head to the stem. It is a good, well flavoured vegetable when

young, but becomes strong and disagreeable as it gets old. There is a yellow kind seldom met with in India, that forms its bulb partly in the earth, and is of good flavour.

*Propagation* is by seed, sown about the middle of September. Recent experiments have also shewn that slips from the previous year's plants, will succeed well.

*Soil, &c.* The soil and treatment is precisely the same as for the Cabbage.

*Carrot* is a wholesome and nourishing root, containing in a thousand parts ninety-five parts sugar, three parts starch, and the remainder water and fibre; there are properly speaking, only two varieties, the early and the late, these are however divided as follows :

*The White* is the earliest kind, and may be sown in the latter end of August, to yield a crop in the beginning of November, and of this kind Patna seed, which answers well, is always procurable : it seldom exceeds eight inches in extreme length, but will grow to a circumference of nine inches or more, and is of very good flavour.

*The early Horn* is the next in succession, and should be sown about the beginning of October, whence it takes three months to be



fit to pull: Cape seed is generally preferable.

*The long Orange* is best sown from the latter end of October to the end of November, which will give crops in February of full size. American seed yields the finest produce, often from twelve to fifteen inches in length, and above six in circumference, of a weight, without the tops, of a pound and upwards each root.

*Propagation* is by seed only, sown where they are to remain, as no long esculent roots should be transplanted, that operation occasioning the production of side shoots, that destroy the main root for the table. This seed is difficult to sow, as the short hairs on the sides cause them to adhere together in lumps, whilst their lightness renders a calm day necessary for the operation; before scattering therefore it will be well to rub the seed between the hands with a portion of sand or wood ashes. Some people prefer germinating the seed before sowing in the spot selected, by tying it up in a piece of cloth and burying it a few days in a warm but moist corner of the garden, but this is unnecessary. The seed ought to be equally distributed and trodden in before raking; about an

ounce will be required for a bed twenty-six feet long and five broad.

*Soil, &c.* The soil for carrots must be light and mellow, mixed with sand, and should be well dug and broken fine to a depth of at least a foot and a half, so that not a lump should intervene to divert the downward striking of the root from its straight course. When the young plants reach two or three inches in height they should be carefully thinned and weeded to a distance of from three to five inches, and then again thinned out to six or eight inches apart as soon as of sufficient size to draw as young carrots for soup, &c. Some of the longest and best roots of the early kinds may be planted out in December or January, in rows, at a distance of two feet, and the plants six inches apart for seed, sticking the flower stalks as they appear to require it, to prevent their being blown down by the wind, they will ripen in May or June.

*Insects.* The greatest enemies to the carrot are the centipede and a kind of many legged, red ring-worm.

*Parsnip* is but seldom found to grow here, and it never has been seen to reach the size it attains in Europe; its peculiar sweetish flavour

makes it less a favourite than its wholesome and nutritive quality deserves; in a thousand parts there are nine of starch and ninety of sugar, the rest being water and fibre. The Guernsey is the best variety, and in Europe often grows to the length of two or three feet.

*Propagation, Soil, &c.* The seed must be fresh and well packed, as it easily spoils; that which has been put up in bottles carefully corked and sealed arrives in the best order; in its culture the same process is to be followed as just described for carrots, thinning out however to about double the distance prescribed for that vegetable: a calcareous is its native soil.

*Red Beet* is used in pickle, especially to improve the colour of cabbage, also boiled and sliced cold either by itself or with salad; it contains more sugar than the parsnip, and is divided into two principal varieties, the long rooted, and the turnip rooted, of these the kinds best grown here are,

1. *The Dwarf, or Early Red*; this may be sown early in October, and will be ready by the middle of December, successive sowings being kept up until the middle of November; it is small, and not so high coloured as the

later sorts, but will be found tender and of good flavour. Patna seed will answer.

2. *The Turnip-rooted*; of this the American is generally the best seed; it should not be sown earlier than the latter end of October, and will then give a good crop early in January; the root is large and round, as well as high coloured; it is well suited for shallow soils.

3. *The Long Blood* is the best kind both in flavour and colour, and, like the last named, should not be put in the ground before the latter end of October, becoming fit to pull towards the close of January; sowings may be continued to the middle of December, which furnish a supply for the table up to the close of March; if attention be given to the furnishing a copious supply of water as the warmth of the weather increases, they may indeed with care be kept on as late as the middle of April. The Cape seed of this sort is good, but the finest roots are decidedly obtained from that which comes from America.

*Propagation.* The best is always raised from seed; two ounces being necessary for a bed of twenty-two feet long, by five in breadth, this must be sown where it is to remain, either

broadcast on a rough surface and well raked in, or what is better, in drills two inches deep, about a foot asunder, and firmly trodden in.

*Soil, &c.* It delights in a deep but rich sand, dry and light rather than moist, previously enriched with a mellow old compost, but rank dung is apt to produce cankers, and the ground should be trenched for the long kinds to a depth of at least eighteen inches. When the plants are about two inches high, they must be thinned to a distance of twelve inches each way, and well cleared from weeds. If the soil be stiff, they are apt to get woody and stringy: the same follows if left too dry when the warm weather has commenced.

*Skirret, or White Potatoe,* is a species of water parsnip, cultivated for its small roundish roots or tubers, which are joined together at the head in clusters; they were formerly esteemed in England, but have now nearly gone out of notice; they originally came from China.

*Propagation.* Although this plant is often raised by offsets, the best way to obtain the root in perfection is by seed sown in April or May, in drills about eight inches apart, which is fit for use in November.

*Soil, &c.* A rich but lightish soil is best

suited for this plant, which when about two inches high, should be thinned to about six inches as under in the drills.

*Salsify*, or *Goat's Beard*, is cultivated for its long tapering roots, of a fleshy white substance, which are boiled or stewed like carrots, and have a mild sweet flavour, something similar to parsnips, but less strong; it is little known here, but deserves encouragement, as it is an agreeable vegetable, and would bear retaining till late in the warm weather.

*Propagation.* Seed is the only mode adopted in cultivating this article, and of this the American appears to be the best, as far as the little experience yet obtained may lead to any conclusion; an ounce is enough for a drill of twenty feet in length; or it may be sown in beds and transplanted: in the only instances that the author has known of the cultivation in India of this vegetable, the seed has been sown about the middle of November, when the first sown has been fit to pull in February and March, keeping up a succession to a late period.

*Soil, &c.* The soil should be light and mellow, and dug full eighteen inches in depth, so as to allow the long root to go straight down;

when three inches high the plants must be thinned to six or eight inches apart, and in dry weather water should be occasionally given until the ground be well soaked.

*Radish*, is composed of the same proportions of fibre, &c. as the turnip, the root being eaten raw in a young state, the seed pods are also when green used in pickles. There are two principal varieties, the long, and the turnip rooted; the latter are the rarest here, and are generally preferred.

*The Country Radish* grows to a large size, but coarse and disagreeable in flavour; it may be sown at almost any time of the year, and if in May, it will give roots fit to pull in June.

*The Long Scarlet Radish* is best obtained from English seed, that from the Cape seldom being true to its kind, and giving a mixed produce; it should not be sown earlier than the beginning of September, nor later than November, and it takes a full month from the time of sowing to be fit to pull.

*The Red and White Turnip Radish* is best if not sown sooner than the middle of October, and should not be cultivated later than the end of December; the best seed is procurable from France or Hobart Town, the former the

most true and smooth skinned; the turnip radish is generally fit to pull in twenty days.

*The Spanish Radish* is a species of the turnip kind, the outside being a roughish brown skin, easily peeled off, when the inside will be found firm, solid, white, and rather pungent; it must be sown thinner than the other kinds as it grows larger.

*Propagation* is solely by seed; one ounce of the turnip-rooted kinds, and one ounce and a quarter of the long, being sufficient for a bed seven feet long by five feet in breadth, and the seed must be raked in to a depth of not less than half an inch.

*Soil, &c.* The soil should be light and finely broken, and as they advance in growth they must be thinned out to two inches apart for the long; three inches, for the turnip; and five for the Spanish and native sorts; watering freely swells the roots and makes them mild and crisp.

*Yam.* There are several varieties of this vegetable, the roots of all being more or less mealy and palatable, being easy of digestion and nutritive; it is best dressed by being roasted in the hot embers. The plant has tender stalks climbing to a great height, and



the roots often grow to so large a size, as to weigh from ten to twenty pounds each. The most esteemed sort found in the plains, is the choopuree aloo, but this must yield to the superiority of those found in the hills, the best of which is small in size, and of yellow flesh. The most common is called the gura-nee, but it is hard, dry, and tasteless.

*Propagation* is performed by planting out the smaller tubers, or part of the large ones, at a distance of two feet apart in April and May, coming to maturity in November and December.

*Soil, &c.* The earth for this root, should be light and open, with a good mixture of vegetable mould or decayed leaves, &c. It requires little subsequent culture.

*The Sweet Potatoe* is a plant of the convolvulus species; the root is long and from an inch to two inches in diameter, with a red outside skin, but the flesh, white and sweet, tender when young, though getting stringy as it grows old; it is a wholesome root, possessing much nourishment, but containing a larger portion of water and sugar in its composition than the yam. The time for planting is April; they will then be fit to dig up in November and

December, and a second crop may be put in the ground in August or September.

*Propagation* is by dividing the roots, or by planting out the small tubers about three feet apart.

*Soil, &c.* The soil and cultivation is the same as is required with the potatoe.

### *Spinaceous Plants.*

The excellence of this class of vegetables consists in the succulency of their leaves.

*Spinach* is composed of very little sugar with a great deal of water and pulpy fibre, and the leaves are used either boiled alone, or with gravies, &c. ; the several varieties differ little in their quality, but the Spanish is to be preferred for India, as more easily cultivated, and affording a larger crop of leaves, not so subject as the other sorts to the attack of insects.

*The Prickly Spinach* should be the latest sown, say for instance the middle of October, and requires a month to yield a good crop, the leaves being then very juicy and of a lighter, and brighter green than the other sorts, and of better flavour.

*The Round Spinach* is also very good, and may be sown from the beginning of September to the end of November : it also takes about a month to be fit to gather ; good seed is obtainable from Patna.

*The Spanish Spinach*, as it is called by the seedsmen at the Cape, appears to be the same as what is termed the Flanders, in England ; the seeds are round and smooth, and the leaves large, dark coloured, and extremely succulent ; it may be sown from the end of September to the end of November, and takes somewhat less than a month to perfect its crop ; it should have a good supply of water while growing, and will then rapidly renew its leaves as they are taken off for use.

*The Green Nepal Spinach* is a good kind, and may be sown early in August, when it will yield a good supply of leaves for the end of September.

*Propagation.* Seed is the only method adopted : sown broadcast in the proportion of one ounce to a bed of fourteen feet long by five broad, treading the seed well down, and covering it with earth about an inch deep.

*Soil, &c.* Almost any soil will do for this plant, but for the early crops as dry a spot

as possible should be selected ; when the young leaves are an inch broad, they should be cleared from weeds, and thinned wherever crowded, to about three inches apart, giving them a subsequent thinning, to double that distance, when the leaves spread.

*The White Beet* has its leaves much larger than the red, very thick and succulent, these boiled as spinach form a good vegetable ; in England it is also esteemed for the mid-ribs and stalks which are separated from the lamina of the leaves, stewed and eaten as asparagus under the name of chard. The Great White or Swiss variety is the best, and may be sown any time between the beginning of August and the end of November ; if the chard is desired for use the watering should be profuse, to promote the succulency of the stalks.

*Propagation, soil, &c.* These are the same as for spinach, save that the plants must be kept at a distance of from ten to fourteen inches from each other.

*The Orache, or Mountain Spinach*, is known here as red and green sâg ; the leaves possess a slightly acid flavour, the green kind is boiled as spinach, but the red, which is the most esteemed, is best dressed with butter and spicy sea-

soning ; it may be sown at any time of the year, and will afford leaves fit to gather in a few days.

*Propagation, soil, &c.* No peculiarity of soil is required for this plant : it should however be kept moist, and a succession of sowings be maintained to ensure a constant supply, except during the cold weather, when it may be allowed to give way to other vegetables of European origin.

*The Sorrel* is much used by the French and Dutch, but little by the English ; it is however very good as a sauce or garnish, or dressed with butter, &c. like the red orache, or lâsâg, as it is here called.

*Propagation* is effected either by seed or separating the roots in the beginning of November.

*Soil, &c.* Though growing wild in our fields in Europe, it requires some care in India, and is best raised in a compost of sand, old dung, and garden mould in equal parts ; it should be planted out at a distance of a foot asunder, and as the stalk runs up it must be cut down and the stool encouraged by the addition of fresh mould, to throw out new shoots with large broad leaves.

*Poi sâg* is a native vegetable of the climbing kind, growing to a very large size, well known in most parts of the country, and propagated either by slips or by seed sown in September or October. It needs no peculiarity of soil, and affords an abundant supply of succulent leaves and young shoots, which are the parts eaten.

The leaves of various plants of the *Tetragonia*, and other species growing wild in this country, are gathered by the natives, and eaten under the general term of *sâg*; but are little known to Europeans.

#### ALLIACEOUS PLANTS.

The Onion tribes are universally known, and esteemed for the stimulus and flavour they give to our food, but though wholesome they contain no nutriment, consisting chiefly of fibre, and possessing a very small portion only of starch.

*The Onion* is familiar to all; and it is difficult to give an estimate of sorts for cultivation

in this country, as the European varieties are extremely difficult to raise.

*The Portugal Onion* is the largest sized, and the most mild in flavour; but the seed seldom reaches here in good order, and even when it germinates, it is hardly possible to secure a plant to reach its full size.

*The Dutch blood-red Onion* is, of all the European kinds, the best suited to India; it may be sown in October or November.

*The Bombay Onion* is a white description, much esteemed, and should be sown towards the close of September, thinned out about six weeks after, to afford young onions for salad, and will be fit to transplant by the beginning of December.

*The Patna Onion* is a red kind, of good flavour; and may be sown at the same time with the preceding, and planted out in January.

*The Small red Onion, or Peeaj* of native growth; it may be sown at any time from the close of the rains to the end of February, the last named month being the period for putting in the most extensive crops, which may be planted out in March, and will be fit to gather in May or June.

*Propagation* may be performed either by

seed, or by planting out the offsets; one ounce of seed being sufficient for a bed five feet broad by twenty-five in length.

*Soil, &c.* The best is a rich mellow ground, manured with very old dung, on a dry subsoil, unless required for pickling only, and then they should have a poor soil to keep them small; powdered bones, or blood, are good manures for increasing the size of onions; if the crop be to remain where sown, the plant should be thinned out when four or five inches in height, to a distance of from three to seven inches apart, according to the size of the kind sown. Many however prefer transplanting them; and in so doing, care must be taken to keep the incipient bulb above ground.

*Insects and diseases.* The grub is the most destructive enemy the onion has; but it may be got rid of, by a plentiful use of lime to the surface of the soil. Of diseases, the rot is most fatal, and this will most commonly be found to have its origin in the admission of water inside the roots of the bulb, by pouring it on the leaves, and its being there fermented by the sun.

*The Leek* is a much more hardy plant than the European sorts of the onion, and will thrive



very well in India ; it possesses the same qualities, but is better suited for soups, or stews. The best variety is the London flag leek.

*Propagation.* By seed ; an ounce being required for a bed five feet broad, by six in length, sown in the middle or end of August, at the close of the rains.

*Soil, &c.* The soil should be light and rich, with a dry subsoil ; a highly raised bed is therefore desirable ; a rank soil destroys the plants. When the plants reach about eight inches in height they should be transplanted into drills, some twelve inches distant, and the plants eight inches apart in the rows, pressing the earth well round the fibres with the dibber, but leaving the stems free ; they will require a good supply of water, and as the bulbs increase they should be earthed up, to blanch them ; they last a long time.

*The Chive* is a hardy plant, very desirable from its easy culture ; and of great use in various preparations for the table.

*Propagation* must be either by slips, or by dividing the roots ; and this may be done at any time, though the preferable period is the close of the rains ; they should not be placed less

than twelve inches apart, as they soon increase to large bunches.

*Soil, &c.* Any soil or situation will answer.

*Garlic* is, like the others of this tribe, an useful ingredient in most dishes.

*Propagation* is performed by planting out the cloves, or small subordinate bulbs, the fit time for this process being the beginning of October; they will be fit to collect in May.

*Soil, &c.* A light rich soil is the best suited for garlic, in which the cloves should be set six or eight inches apart, and not put in too deep.

#### ASPARAGACEOUS PLANTS.

Of this class, which comprehends the more delicate flavoured vegetables, the young shoots or incipient blossoms are the eatable portions.

*The Asparagus* is the chief of this class, and gives name to the whole, the young shoots being well known as a delicate article for the table; it is considered a wholesome article of food. The few varieties in Europe are the

result of cultivation, but are little known in this country.

*Propagation* is best performed from seed, but it is more tedious than the common mode of dividing the roots, resorted to to save time in forming a bed: the seed should be trodden down gently before raking in; it may be sown at any time that fresh healthy seeds are procurable, though the end of September is perhaps the fittest period. The young plants must be kept cleanly weeded.

*Soil, &c.* The soil for asparagus can hardly be too rich or too strongly manured with dung and litter, at the same time having enough of sand, to make it sufficiently light to allow the young shoots making their way easily through it. The best plan in forming a bed is to trench the ground to a depth of two and a half feet, and a width of some five feet, having plenty of good dung at the bottom of the trench; above all things a wet subsoil is to be avoided, as that would rot the shoots. When you have filled up the trench over this layer of dung with a strong, rich, loamy, or sandy soil, make small trenches at a foot apart and six inches deep, and put in the young plants from the seed bed, or the

divided roots, as it may be, at about nine inches apart in the row, and cover well and lightly with the earth taken out of the trench. For the first two years the plants must be allowed to run up to stalk, only clearing the bed from weeds, and occasionally stirring the surface; in the third year, when the plants have run to seed and begin to dry, cut them down close, and loosen the earth all over the bed with the pronged hoe, dressing the whole with a fresh layer of sand and vegetable mould. The bed should now be well watered every day, and when the young shoots appear, cut only the largest, leaving the others to run up to seed, as too large a crop must not be exacted, or the shoots will be weakened for future supply. From this period, with care, a bed will continue to furnish a good supply for ten or twelve years. The supply of water during the time that the stools are giving their crop can hardly be too plentiful, it is well therefore to have the asparagus bed near the tank, or at all events on the side of the main stream from the pumps, so that it may be flooded once a day during the hot and dry weather. If an early crop be desired, one of the beds should, after the plants being cut down and

dressed, be guarded with a ridge all round, and flooded, allowing the water to remain on for two or three days.

*The Sea Kale* is a hardy, but highly esteemed vegetable; the young shoots and stalks of the unfolding leaves being the parts used. It is mentioned here more as an article deserving of attention, than as one of actual cultivation, as it is believed few, if any, instances have occurred of its having been yet successfully cultivated. Within the personal knowledge of the author of this little work, several experiments have been made in sowing the seed, most of which failed altogether, not even germinating; two however, so far succeeded as to prove the practicability of adding this delicious vegetable to our Indian stock of garden productions; the plants in these instances having been destroyed partly by insects, and partly by having a dressing of ashes put on to the bed too soon.

*Propagation* must at first be from seed, and gardeners agree that it is generally best so raised. The best time for sowing is believed to be about the middle of November; the seeds must be put in at a depth of two inches, and require about a month before the plant shews itself above ground.

*Soil, &c.* For the seed bed a good compost is well rotted dung, sand, and vegetable mould in equal parts; perhaps even a larger portion of sand would be preferable for the beds where the plants are to remain. A spot must be selected having a dry bottom, and they must be trenched in the same way as for asparagus, mixing a large portion of sand with the compost with which the trenches are filled, and in this the plants are to be inserted at a distance of two feet each way. The crop should not be taken for the first two years; but in the third, when the plants are beginning to shoot, the beds should have a covering thrown over them of about an inch of pure sand, or sand and ashes, and a blanching pot should be put over each plant, pressed down closely to exclude all light and air.

*The Artichoke* is cultivated for its flower heads, which in an immature state, freed from the leaves, bristles, and seed-down, are a very favourite vegetable; the conical is the best flavoured variety.

*Propagation.* By seed is the best mode of extending this plant, sown in the beginning of August under shelter, either in a small bed, or what is preferable, in pots; but it may be done

by slipping off the young shoots or suckers, and planting them out towards the close of the rains into sheltered beds of rich earth.

*Soil, &c.* The soil best suited to the artichoke is a rich mould with a small admixture of sand, and the best way to form your bed for these plants is to select a spot in the month of June or July, and cover it to the depth of from four to six inches with a mixture of decayed vegetable matter and well rotted cow dung, in the proportion of three parts of the former to one of the latter, letting this be well dug in, and the ground allowed to remain untouched, except to keep it clean from weeds. As soon as the seed leaves fall off from the young plants they should be pricked out into a sheltered bed, at a distance of four inches apart, and again at six inches distance when they reach the height of about three or four inches. About the end of November or beginning of December, mark out the spot you have retained for your bed into squares of about two feet on each side, and two feet apart; take out the earth to a depth of about four inches, and fill the hole with a mixture of sand, vegetable mould, and rotted cow dung, in equal portions; then transplant the artichokes

into these squares, putting four in each, at a distance of one foot from the centre, fixing the root firmly, and giving water every day until the plant begins to shew new leaves, and then giving a more moderate supply of moisture until the blossom shoots appear, when the earth must be brought up to the roots and the watering increased to the roots, to enlarge the size of the main heads; all the lateral ones should be taken off in a very young state; some cut off the ends of the large leaves for the same purpose. As soon as they have done giving fruit, the plants should be taken up, and the shoots and slips planted out in a sheltered bed for the next year's supply of plants.

#### ACETACIOUS PLANTS

are eaten raw, and are rather articles of condiment and luxury, than of food.

*The Lettuce* is a cool and wholesome salad, containing a little sugar and a large portion of water and fibre, together with a bitter milky juice of a slightly soporific nature. The varieties are numerous, but these are little attended to in India.



*The Cos Lettuce* is upright, of an oblong shape, and when full grown is tender and of a delicate flavour. They should not be sown before the middle of November and may then be continued at intervals to the middle of December; if sown later, they are apt to run to seed, without forming heart. The plants from Patna seed will require six weeks to be fit to cut, whilst those raised from English seed, will require from eight to ten weeks.

*The Cabbage Lettuce* is the proper description for early sowings, and these may be commenced in the middle of August, or even earlier; but in this case they must be cut when small, and not full grown. Sown in July very good lettuces may be had in September, and continued every ten days until the end of December; they take from six weeks to two months to be fit to cut.

*The Brown Lettuce* is vapid and coarse.

*Propagation* is performed only by seed, the early crops being sown in sheltered beds or pots under cover, a quarter of an ounce being sufficient for a bed of eight feet long and five broad; the seed must be lightly raked in, and then the earth lightly pressed, to make it more difficult for the ants to abstract; for if not

carefully watched, in a few hours after the seed is sown they will take the whole away, on which account it is advisable to strew the ground thickly with pounded turmeric, or huldee, immediately on sowing.

*Soil, &c.* A rich mellow soil is requisite for lettuces, and they are better if transplanted, when about three inches in height, into rows ten inches apart, and from eight to twelve inches distant in the rows.

*The Endive* is a pleasant salad, but requiring to be blanched to remove the bitter taste ; it has the same properties as the lettuce. The white curled is the best kind in this country, and as its seed ripens well, a portion should always be preserved for early sowings, which may commence in the middle of August, and may be continued till January. It will require about ten weeks before it is cut.

*Propagation* is by seed, an ounce being a fit quantity for a bed sixteen feet in length by five broad. The seed should be thinly scattered, and well raked in.

*Soil, &c.* A rich mellow earth gives the finest heads; the plants should be early thinned in the seed bed, and transplanted when they attain a height of about four inches into rows

about eighteen inches asunder, and about twelve inches apart. In planting, the tap root must be shortened, and the long leaves trimmed; they must have a good supply of water while growing, and when the heart becomes full they should be blanched, by covering with a flower pot reversed, or a blanching pot, or by tying up the leaves, during which but little water should be given: and it is to be borne in mind that this operation must not be performed on too many plants at once, but in regular succession, as many as are required for daily consumption, as when once blanched the endive soon rots, from the confinement.

*Celery* is used as a salad when blanched, or the tops and unblanched plants add a fine flavour to soups, stews, &c. When blanched it contains a little starch and sugar and much fibre. There are four varieties, all deserving of cultivation.

1. *The Red Solid* is a fine hardy description, but rather apt to be strong. It should not be sown before the middle of November, when, if English seed, it will take about ten days to germinate, and will be fit for the table in the end of March or beginning of April.

2. *The White Solid* is an early sort, and may

be sown in August in a sheltered spot; it will give a crop by so doing in December.

3. *The Italian* is a tender, well flavoured variety, but does not reach so large a size as the two former kinds. The middle of October is a good time to sow, and you will have the plants by so doing fit for the table in January.

4. *The Turnip rooted, or Celeriac*, is little known in India.

*Propagation.* All sorts are raised from seed, a quarter of an ounce being sufficient for a bed five feet square

*Soil, &c.* It must be rich from vegetable mould, but not rank; it is well to prick out the young plants when about two inches high, (removing the tap root to encourage the multiplication of lateral fibres) into a bed at four inches apart, allowing them to remain there until they attain a growth of from six to ten inches: they should then be transplanted into trenches about a foot wide and three feet asunder, running from east to west, dug out about eight inches in depth; the bottom should be well manured, and trodden down close before planting, and the excavated earth must be packed smoothly and firmly at the sides of the trench; the plants

must then be trimmed from any straggling leaves, and all side shoots slipped off and put in at the bottom of the trench, about six inches apart, giving a good watering immediately, and repeating it every day by opening one of the water courses of your garden into the end of each trench, so as to give a good supply to the roots without allowing the moisture to touch the leaves, which must be carefully attended to during the whole process of blanching, or the plants will assuredly rot. As soon as the plants begin to grow in their new position, they should be carefully earthed up by drawing the mould from the sides of the trenches, attention being shewn to the removal of any side shoots that may sprout out, and the plant held firmly and evenly together with the hand, whilst the earth, which must be made fine, is drawn up so that no particle may get into the heart or between the leaf stalks. The earth should also be firmly pressed and brought to the height of about half an inch below the lowest leaves. This operation should be repeated every week, each time removing any side shoots that may be formed, and plenty of water must be daily supplied, in the manner before mentioned. The turnip rooted kind, or celeriac, must not

be much earthed up, or it is apt to revert to its primitive long form.

*Insects.* The celery is chiefly liable to attack from the red earth worm, and the small centipede, which must therefore be searched for at each earthing up, and destroyed wherever found.

*The Cress* has a peculiarly warm and grateful flavour, arising from the nitrogen contained in it, and is known to most people.

*Propagation* is performed by seed only, which may be put in at any time of the year, taking care however that it is sheltered during the heavy rains; it germinates rapidly, requiring only a few hours in the hot weather. One ounce should be sown on a bed of three feet by five in small drills, and rather thinly scattered on a light well pulverized mould, covered very thinly by sifting the earth over it from a small sieve.

*Water Cress* is a favourite salad, especially as eaten with bread and butter at breakfast.

*Propagation* is performed either by seed or dividing the roots or offsets, put out in large pots or gumblas, and kept nearly covered with water in a sheltered situation. The water must be frequently changed, and

the plants renewed every year, or they will acquire a disagreeable earthy flavour.

*Purslane* has a round full stem and fleshy leaves, very slightly acid in flavour; esteemed cooling, by some. It is used as an ingredient in salads, but is a poor tasteless thing.

*Propagation, soil, &c.* It is raised by seed sown in almost any kind of soil.

#### CUCURBITACEOUS PLANTS

are all of a cooling nature, and generally much esteemed by all classes.

*Cucumber* is used green, sliced as a salad, or pickled when young. There are very many varieties; those best known and esteemed in India are the following,

1. *The Long Green*, growing about ten inches in length. The American seed is preferred; it is best if sown at the end of April, when it will fruit freely in July.

2. *The Nepal* is a fine delicate flavoured cucumber, of a white colour and large size. It may be sown at any time between the beginning of June and the beginning of August, yielding its fruit from August to November.

3. *The Cape Dwarf* is a good little cucumber that may be advantageously sown from March to October.

*Propagation* is by seed, sown at a sufficient distance to give the plants room to run, putting several seeds in each hole.

*Soil, &c.* The soil should be rich and light, well manured with stable dung; when the plants acquire the fourth leaf, they should be thinned to two plants in each hole, and these stopped by pinching off the leading shoot; and as the runners spread, they should be so trained as to be kept pretty clear from each other, and if the soil be low or wet, or the rains heavy, it is well also to raise them on a trellise or muchan.

*The Gourd, or Pumpkin.* Of these there are very numerous varieties in India, the fruit being used in many native dishes as well as in European cookery, and the tender shoots boiled by natives as a kind of greens. The fruit is considered cooling, but has not much flavour.

*Propagation.* They are all propagated by seed, and some of them run to a very large size, covering a small native hut in a very short time. The soil and cultivation is the same as for the cucumber.

*Squash, or Vegetable Marrow,* is a very deli-



cate vegetable of the gourd kind ; and has several varieties, the chief of which are,

1. *The Crook-Necked* when about six inches long is well flavoured, but it soon gets hard and stringy. Seed sown in January will give fruit in April.

2. *The early Long Warted* is more delicate than the foregoing, and if sown in October will give its fruit in December. The sowings may be repeated every fortnight until the end of January, and again in April until June.

3. *The early Scollop* is the best flavoured of any of the squash kind. It may be sown advantageously from the middle of October to the end of January, and will give fruit in perfection and abundance from the middle of December to the middle of April.

*Propagation* is only by seed, and it is best not to transplant them, but let them remain where sown, in little circles about six feet apart, drawing out the weakly plants. The best seed is from America.

*Soil, &c.* The soil should be a rich loam, and they should be trained on upright sticks or a small trellis, to insure the setting of the fruit. It will be well to fertilize the female blossoms by approaching the anthers of the

male flower, when well charged with pollen, to the stigma of the female blossom.

*Insects.* Their greatest enemies are the ants, which pierce and destroy the young fruit; pounded turmeric (huldee) strewed around the roots, is the best preventive.

*Pulwul* is a small creeping plant of the gourd kind, yielding a fruit about the size of an egg, much used in curries.

*Propagation* is by seed sown from January to March, to yield fruit from March to May, or it may be increased by parting the roots.

*Soil, &c.* The plants require a good deal of room, but almost any soil is equally productive.

*Turace* is another indigenous plant that affords a nice vegetable from May to the end of August.

*Propagation, soil, &c.* is by seed only, sown from April to the end of June; any soil suits it, but it should have a trellis, or sticks to support it, and prevent the fruit from being injured by laying on the ground during the rains.

PLANTS, THE FRUIT OF WHICH IS USED AS  
A VEGETABLE.

These are most of them of a delicate nature, and chiefly of use in pickles.

*The Tomato, or Love Apple* has a slight acid flavour, esteemed in soups and sauces, as well as in a green state as pickle.

*The Large Red* is the best flavoured, but is long in coming to perfection; the best time for sowing is the middle of October, when its fruit will be ripe about the end of January.

*The Small Round, or Cherry*, is inferior in flavour as well as size to the foregoing; its colour either pale red or yellow. It may be sown either in September or October, and will give its fruit early in December.

*Propagation* is performed by sowing the seed in pots or in a small bed, where they remain only until they reach about two inches in height. The best seed is from America.

*Soil, &c.* A moderately rich soil is desirable, into which they should be pricked out when from two to three inches high, at a distance of four inches, and removed when from six to eight inches in growth, to the bed where they

are to fruit, in which they should stand in rows two feet asunder. The plants being eighteen inches distant from each other in the rows, they should have sticks to support them.

*The Garden Egg, or Brinjal*, as it is called here. There are an immense variety of this plant, most of which are held in esteem, but they all require the same treatment. The chief sorts are the *ordinary purple*, the *large purple*, the *tapering purple*, the *Bombay white*, attaining a very large size, the *ordinary white*, and the *small white*.

*Propagation* is by seed, which may be sown at any period, though the best time for the large sorts is to sow in April or May.

*Soil, &c.* No particular soil is required, provided it be not too heavy or hard. The plants should be put in at two feet apart, and kept well weeded.

*Maize, or Indian Corn*, is cultivated for its ears or cobs, which are eaten green, after being roasted over the fire, and form thus an agreeable vegetable. There are several varieties, of which the white kind, grown in the hills, is the largest, superior even to the American, generally supposed the finest; the white sort from Juanpore is also very fine, but

the small yellow kind, common in Bengal, is perhaps the most delicate flavoured.

*Propagation, soil, &c.* It is produced from seed sown in the latter end of May, and takes about two months to be fit to gather; many people however sow an early crop, but it generally turns out very poor and indifferent.

*Nastertium, or Indian Cress.* The seeds are used pickled like capers.

*Propagation, soil, &c.* It is cultivated by seeds only, which if sown in the middle of October will give seeds fit to gather in March; unless the weather becomes too hot by that time. To secure a fine crop however, the best way is to sow in pots, under shelter, during the rains, and put out the plants into the open ground as soon as the rains cease.

*Capsicum* needs no description to any one in this country, where it is so universally used as a condiment. The varieties are far too numerous to mention here, a few only therefore are noted of those most deserving of the attention of an European.

1. *The Large Capsicum* is the best for pickling, and grows to a great size; it should be gathered before it becomes red, for this purpose. The seed should be sown in August

in pots under shelter, and the fruit will be fit to pull in November.

2. *The Nepal Pepper* is a good sort for use green, as a condiment, or when ripe for putting in pickles. It should be sown about the same time as the preceding.

3. *The Black Round Pepper* gives a good flavour to pickles, and is therefore worthy of cultivation.

4. *The Long Red* is the best for drying when ripe as a condiment; it should be sown in September.

5. *The Bird Pepper* is small but very hot, and best suited for making Cayenne pepper, for hot vinegar, &c. It may be sown in pots in July.

*Propagation* is performed by seed, sown in pots, a quarter of an inch deep.

*Soil, &c.* A light well manured soil is the best for all kinds, in which the plants should be pricked out at about four inches apart, when they attain a growth of three inches, and afterwards put out into a bed of rich light earth, when they attain six inches in height, giving them a good supply of water, and keeping them clear from weeds.

*The Okro*, called here *dhenroos*, *ramturaee*, &c. is a species of hibiscus, the fruit of which in

a green state affords a very mucilaginous vegetable, much liked by some people. It is indigenous.

*Propagation.* The seeds may be sown at any time between the middle of April and the middle of October. The natives generally prefer sowing in June.

*Soil, &c.* A rich soil is the best suited for this plant, into which it should be transplanted, at not less than two feet asunder each way. It requires but little attention when once it has taken root.

#### HERBS, ETC.

*The Parsley* is a well known plant, used alike as a pot-herb or as garnish, for which latter purpose the curled is the best variety.

*Propagation, soil, &c.* Sow the seed in small drills about nine inches apart, in the beginning of October, and cover with earth half an inch in depth. It will take from ten days to a fortnight before it comes up. In gathering, care should be had to cut smooth and even, so as not to injure the young shoots. It will require watering in the hot weather.

*The Fennel* serves as garnish to many dishes, or to flavour salads ; it is indigenous to India.

*Propagation, soil, &c.* The roots will divide into offsets, but the most general mode of propagating is by seed sown in drills, nine inches apart, in light earth, in the month of October.

*The Dill.* The leaves are used in soups and other dishes, as well as to give a flavour to pickles, the seeds also are used in medicine as a carminative.

*Propagation, soil, &c.* Is the same as in cultivating fennel.

*The Horse-Radish.* The root scraped is pungent, and used as a sauce to roasted beef.

*Propagation, soil, &c.* It prefers a deep, soft, sandy loam, moderately moist, in which the tops or leading buds of old plants should be set.

The real horse-radish is seldom met with in India, a substitute being found in the root of the sujna tree in Bengal, which grows to a large size, but is very woody.

*The Thyme.* The young aromatic leaves and tops are used in stuffing, soups, &c. but it is a very delicate plant to rear and preserve, as being kept too dry, or having too much moisture are equally obnoxious to it.

*Propagation* is best performed by seed, but it



may also be increased by slips, and by dividing the roots.

*Soil, &c.* Rich light earth is requisite for this plant, and they should not be nearer than six inches apart.

*Insects, &c.* A little black fly is the worst enemy this plant has, stripping it of the leaves and young shoots as fast as they appear ; smoking with dry grass or tobacco is the best destroyer of this insect.

*The Sage* is used also in stuffing for strong meats. The common variety is indigenous to India, and grows rapidly to a large size, but the best is the *small leaved green kind*, the best seed of which is procured from America.

*Propagation.* The common kind is multiplied by slips, cuttings, or layers, at almost any time of the year. The small leaved green sage is raised from seed sown in October in a pot, whence it may be put out in the open ground in January.

*Soil, &c.* Any moderately good soil will suit this plant ; in culture, all it requires is to be kept clean from weeds, and the long straggling branches to be cut down occasionally, so as to present a regular bushy head ; it should be fresh planted every three years.

*The Mint* is highly aromatic, and there are two varieties cultivated here, the common, or spear mint for culinary purposes, and the peppermint, useful medicinally.

*Propagation* is performed by planting out the offsets, which are very numerous; the best time for this operation being in September, after the close of the rains.

*Soil, &c.* Both kinds prefer a moist, cool soil, and only require to be watered and kept clean; the beds should be renewed every year, or the plants get straggling and weak.

*The Marjoram* is a sweet flavoured aromatic herb, much used in flavouring soups, stuffings, &c.; a stock for the whole year may be secured by cutting down the full grown branches and drying them.

*Propagation.* It may be increased by cuttings, but the best method in this country is by sowing the seed in October in pots, in a rich loamy soil; the best seed is from America.

*Soil, &c.* A rather dry soil and shady situation is requisite for this herb, in which the plant should be put out when about three or four inches in height.

*The Basil* is an useful aromatic plant of easy propagation, esteemed on account of its strong

flavour for seasoned dishes and soups. There are two varieties, *the sweet* and *the bush or dwarf kind*; the former is the largest and the fastest grown. Both kinds are naturalized in India, although originally brought from Persia.

*Propagation* is by seed sown thin, to obtain which one or two plants should be annually reserved; the sowing should take place in the end of September.

*Soil, &c.* It grows best in a rich soil a little sheltered, and in transplanting, which should take place when the plants are from three to four inches high, the roots must be taken up with a ball of earth.

*The Anise* is cultivated for distillation, and expression of the juice, and used medicinally.

*Propagation, soil, &c.* By seeds sown in a light dry soil in October, and allowed to remain where sown, thinning out the weaker plants, as it does not bear transplanting.

*The Coriander* is cultivated chiefly for its aromatic seeds, used in confections as well as medicinally.

*Propagation, soil, &c.* It should be sown in October on a light low rich soil, deposited by the inundation. It will ripen in December.

*The Cummin* is grown for the same purposes

and in the same manner as coriander, but it does not ripen until April.

*The Rue* is a strong smelling shrub, possessing some medicinal qualities.

*Propagation, soil, &c.* It is easily multiplied by slips or cuttings put in a poor calcareous soil, in a shady situation.

*The Camomile* is a bitter aromatic plant, the flowers of which afford a good stomachic when infused. It is a hardy plant, the single variety only being found in this country.

*Propagation* is effected by sowing the seeds in a sheltered bed in the early part of September, or by dividing the roots.

*Soil, &c.* When of sufficient size the plants should be put out at eight or ten inches apart, in a poor sandy soil; they require a good share of moisture to flower freely.

*The Wormwood*, grown for its seeds chiefly: it is also useful to poultry.

*Propagation, soil, &c.* Any soil suits this plant, and it may be grown either from seed, cuttings, or division of the roots.

*The Balm* affords by infusion a grateful drink in fevers, and every garden should therefore have a few plants of it.

*Propagation, soil, &c.* It grows freely in any

good garden soil, and is readily increased by dividing the roots, or by slips planted out at the close of the rains.

*The Lemon Grass*, like the foregoing, yields a refreshing drink in fevers, and should therefore be cultivated.

*Propagation, soil, &c.* It requires no particular soil, and is easily multiplied by dividing the roots.

*The Rosemary* is used in infusion, and the flowers in distillation of perfumed waters.

*Propagation.* The finest plants are raised from seeds, but it is generally propagated by slips.

*Soil, &c.* The plants should be twelve inches apart, and they like an open, free, limy soil, especially the rubbish of old buildings.

*The Lavender* is an aromatic plant well known to Europeans, but cultivated in India with great difficulty.

*Propagation.* The most usual mode in Europe is by slips and cuttings, but it is extremely difficult to make these strike in India. The seed should be sown in the middle of November, and will find assistance either by being sown on a hot bed under glass, or if in pots, from having a wet blanket placed over

the pot, and exposed to the evaporation of the sun, as otherwise much of the seed usually fails, and even with this assistance it will require a fortnight to germinate.

*Soil, &c.* When the seed leaves fall off, the plants should be put out separately into small sized pots, freely watered, and kept under shelter until they reach the height of about six inches, when they are fit to be put into the open ground; but this should only be done between the end of September and the beginning of February, as they must have sufficient time to become well rooted before the hot weather sets in.

*The Ginger* is a pleasant pungent root, well known to every one.

*Propagation.* It is extended by parting the roots, or planting out the previous year's tubers in April and May.

*Soil, &c.* A dry, light soil, with a good portion of manure in the trenches, is the best for ginger, the sets being put in, in rows about eighteen inches distant, and from eight or ten inches apart, and covered lightly; it will be fit to take up in the February following.

*The Turmeric* is much used in curries, as well as to give a yellow dye.

*Propagation.* This is done by dividing the roots, or planting the fresh tubers from the beginning of March to the end of May.

*Soil, &c.* A rich mould is the best soil for turmeric, and the sets should not be put nearer than six inches, in a bed about two feet or two feet and a half wide ; it may be taken up in February.

*Amada, or Mango Ginger,* is a great addition to pickles.

*Propagation, soil, &c.* is in every respect the same as the foregoing, to which it is closely allied.

#### EDIBLE FUNGI.

These have received little attention in India, yet they afford a most grateful addition to our vegetable produce, whether freshly boiled, or stewed, preserved as a pickle, dried, or converted into catchup.

*Mushroom.* The only one of this class known here has not yet received the attention and cultivation it deserves, being only occasionally made use of when found growing spontaneously on an old dung heap, or other fa-

vourable spot for its production. The wholesome sorts are readily distinguished as being of middle size, of a fine pink or flesh colour in the gills, changing as they advance to a chocolate, and of a pleasant smell.

*Propagation* is performed by spawn, a white fibrous substance, running like broken threads among the dung, &c. where the mushroom is found growing, and producing when planted small tubercles, which placed in a moderate hot bed produce the mushroom; it is found most abundantly as the rains subside, which is a good time therefore to collect it, as it is then in its most active state of vegetation.

*Culture, &c.* Provide good horse dung, and build with it a square bed of the size required, taking care to shake and mix up the dung and litter well together, and form the bed with a narrow shaped ridge, above three feet in height in the centre; leave it to settle and expend its first heat in vapour; this will take about a fortnight, then choose the spot where the bed is to remain, selecting as dry a foundation as possible; reconstruct the bed thereon, keeping it still in a sloping ridge at the centre, and treading down the dung as you proceed,



mixing well the dung and litter ; when this has remained a sufficient time for the heat to become moderate, cover the sloping bank about two inches thick with fine sifted mould, leaving the ridge in the middle open for the steam to evaporate as it rises ; when this ceases the top also may be covered with mould. Then divide the spawn into small lumps, planting them six or eight inches asunder in rows at about the like distance, inserting the spawn close down to the surface of the dung. The bed should be afterwards very lightly watered from a fine rose, with water about the temperature of new milk ; cold water inevitably destroys not only the growing crop but the whole of the spawn likewise, and thus renders the bed of no further use. In gathering the mushrooms, care must be taken to twist gently the mushrooms removed, so as not to disturb the young plants that will be found clustering at its foot, but at the same time not to leave any portion of the stem of the one gathered, as that would rot, and seriously injure all around it. It will be necessary to make new beds every eight or ten months.

## **Fruit Garden.**

The Fruit Garden is the next subject of consideration; this should also be well trenched, and attention should be paid to the subsoil that it be not of a corroding quality, as clay, and free from white ants; drainage must also be carefully attended to, that the water may not lodge on any part; this may be easily secured by so forming the fruit borders that they may have a gradual slope towards the tank, or the principal drains leading to it, and the depth of good mould should be fully three feet; a loamy soil is to be preferred. Trees should not be too much crowded, and to prevent this, great attention must be paid to the probable size to which each will grow, before fixing on a site for it. The fruit garden should be well sheltered to the north and north-west by high trees; and plantains, or other straight growing trees, will be well to the south to break the force of the wind from that quarter, and lessen its heat during the hot weather. In a country where the fruits of Europe are but little known, and not everywhere attainable, they should perhaps form a

separate class; but as this would lead to enlarging on them beyond what is intended in the present work, they will be found together.

#### STONE FRUITS.

*The Peach* is the most generally esteemed of these, and has become naturalized to all parts of India. The criterion of a good peach is, that the flesh is firm, the skin thin, and of a bright red colour on the side next the sun, the stone small, the pulp plentiful, of a yellowish colour, and the juice abundant. The best variety is the round peach, having a small stone, seldom met with in Bengal, but common to the west and north-west of India; but the most common kind is the China flat peach, of a hardy habit, and an abundant bearer.

*Propagation.* New varieties are raised from the stone, but to perpetuate those that are already approved, budding or grafting is resorted to, for which the plum is recommended as a good stock, and in England the almond has been found valuable for the finer sorts; in this country, however, the seedling peach is commonly used for this purpose, and it is found

advisable to select such as have been raised from the stones of the best flavoured peaches.

*Soil, &c.* A light mellow loam is the best, of a depth of a foot and a half to two feet, with a tolerably dry bottom ; too much manure causes the tree to run too much to wood.

*Culture.* After a graft has been planted out for a season, the buds that are within a foot or eighteen inches of the ground should be all rubbed off, and in January the leading shoot should be cut down to six buds ; as the new shoots extend themselves they should be trained in a lateral direction so as to form an espalier in the fan or horizontal manner ; for though usually allowed to become standard trees in this country, experiments have shown that training benefits the fruit in quality, as well as affords greater protection against storms, besides opening the fruit to the sun, to say nothing of the greater facility of access that mode affords to all parts of the tree ; the espalier may be about eight or ten feet high, by eighteen or twenty in extent when full grown. The two following seasons the leading shoots should be again shortened, leaving one central and a succession of side shoots, or a regular course of side shoots, according to the form

of training adopted ; after this the tree may be considered formed, and the endeavour should be afterwards to preserve the form as much as possible unaltered. None of the leading shoots should be shortened, nor any that are well situated, or full of blossom buds, unless they grow so long as to become weakened, or greatly exceed the bounds of the training, or appear unhealthy ; and the trees should be frequently looked over to remove superfluous wood buds by rubbing off or cutting out such shoots as are crowded ; but care should be taken not to shorten any branches that are intended to bear fruit in the season next ensuing, though if they grow too long they may be bent back to check their progress. When the rains set in it will be well to raise a mound around the stem, covering it with tiles to prevent the water penetrating to the roots ; at the close of the rains the earth should be opened to expose the roots for not less than three or four feet all round the stem, and all the root fibres that shew mildew, or are otherwise injured, must be carefully pruned off with a sharp knife ; as the sap ceases to circulate rapidly, and the leaves fall off, a thorough pruning should be made, removing all wood that has borne fruit or other-

wise become useless or crowded, and shortening all shoots not intended to bear in the next year to four eyes each, preserving an equal distribution of the bearing shoots. As soon as a few blossoms appear the roots may be covered in with good strong loam, avoiding all fresh dung or rich manure, as calculated to promote too great a production of wood. If there be any disposition to frost, mats should be put over the trees to protect the blossoms at night. As the fruit sets they should be thinned regularly, care being taken not to leave two peaches any where on the same spur, and as the blossoms are passing to fruit water must be plentifully supplied to the roots and continued until the fruit changes colour; this is best supplied by a trench round the tree, at a distance of three feet, to be filled with water every day; some people ring the trees to increase the production of fruit, but with a tree bearing so readily as the peach, this process is hardly necessary; the fruit ripens in April and May.

*Insects, diseases, &c.* The red spider, and a species of plant louse that attacks the leaves and raises tubercles on them, are among the enemies of the peach; soap or tobacco smoke are considered the best destroyers of these in-

sects. The red ant and a large species of lizard attack the fruit when set, but the greatest enemy to this tree is the white ant, which insidiously destroys the root; and the first intimation of its ravages is generally the death of the tree, without any apparent cause; the only remedy is constant watching, opening the roots as soon as any appearance of the white ant is made, or its presence suspected. The mildew, caused as is supposed by minute fungi, is among the diseases of the peach; this may be destroyed by dusting with sulphur, but the only sure remedy is renewal of the soil, and abundance of air. Gum is another disease very weakening to the tree; the most skilful French gardeners cure this by cutting out the part affected, and covering the wound with a mixture of cow dung and loam.

*The Apricot* is very rare in India, and even when produced is generally found very inferior to the fruit as obtainable in Europe, although a white kind is occasionally found in Upper India of good size, and tolerable flavour; the general management and culture are the same as required for the peach.

*The Almond* is unknown in lower India, though obtainable in the Upper Provinces,

but a substitute is found in the fruit of a shady tree common in all parts of the country, and requiring no particular culture.

*The Plum* is rare, but may be met with occasionally, and is indigenous in the hills; it is therefore evident that it only requires to receive attention to be as common as the peach, like which it should be cultivated, except that it does not so much require to be trained; some good varieties are to be found in the western provinces.

*The native Plum, or Bair*, a small species of which grows wild; but a larger sort is esteemed by some people.

*Propagation* is performed by grafting on the stock of the wild tree. They yield fruit in January.

*The Cherry* is found only very far to the north-west and in Affghanistan, but it is to be hoped that it will soon find its way to all parts of India; the black cherry, and a variety similar to the may-duke are common there, whence the seeds have been sent to various parts, the success of which has yet to be proved.

*The Mango* is a highly esteemed and well known fruit, growing on a large spreading tree. The varieties are very numerous, the best be-



ing the Bombay, the small Scarlet, and the Malda; and latterly attention has been paid to the introduction of a double bearing species of good flavour, giving an early and a late crop every year.

*Propagation* may be effected by seed, but it is a slow process, and necessarily uncertain, as no dependence can be placed on the quality of the fruit. The best way, therefore, is to graft from an approved tree on a stock raised from seed, of which every garden should always possess a good supply ready to receive grafts.

*Soil, &c.* A fair garden soil of any kind will suit this tree.

*Culture.* After the graft is planted out it requires little attention beyond keeping the ground clear from weeds, and rubbing off the leaf buds that appear within two feet from the ground, unless it be determined to train the tree in espalier form, which although seldom attempted, is well worthy of trial, as possessing many advantages over other modes of culture, and having been found successful in the few instances where it has been tried; in this case the young shoots must be laid in the form required, and all superfluous ones taken off; as a standard, it is only requisite

to preserve an even stem and a regular well formed head. In the third year the first blossoms will appear on the extremity of the shoots, but they should be carefully taken off until the fifth year, when the fruit may be allowed to form, but thinned out so as not to over work the young tree, and in no place should two be allowed at any time to remain on one stalk. The trees should be dug round every year in the month of December or January, and a good supply of manure bestowed on the roots, for which purpose the earth from the bed of a river or the bottom of a tank is the best; and as soon as the blossoms appear a trench should be opened round the tree, at a distance of four or five feet from the trunk, and this must be filled with water every morning until the fruit begins to ripen.

#### KERNEL FRUITS.

*The Apple* is but seldom found in India, although it has been known with care to produce very fine fruit in many parts of the

country; and even in Bengal solitary instances are known of the tree having produced good fruit, although the moisture of the soil causes it generally to exhaust its strength in the formation of useless wood. The Nonpareil and the Ribston pippin, are sorts known to have been successfully cultivated, and to have fruited well. The Western provinces have the fruit commonly, but it is inferior to the European sorts, and requires cultivation. The tree is indigenous to the hills, and might therefore, there is little doubt, be successfully cultivated in many parts of the country where it has hitherto been untried.

*Propagation*, to secure a good kind, must be only by grafting on stocks either of the wild apple, or seedlings from the cultivated sorts.

*Soil, &c.* A clayey soft soil, with some admixture of chalk, on a dry subsoil, is necessary for the good culture of the apple, and this should be well drained, as the lodgment of wet produces canker.

*Culture.* The ground must be kept clear from weeds, and the roots should be occasionally watered moderately. Too much pruning is injurious, but the trees might be successfully trained on espaliers, which would faci-

litate the frequent examination of the trees, to destroy insects, and cut out canker wherever it may appear. In pruning, it must be borne in mind that the mode of bearing is on small lateral spurs, on strong short shoots, from an inch to two inches in length, springing from healthy branches of two or more years growth, the same spurs producing fruit for several years. All blossoms appearing at improper seasons should be removed, as they do not yield fruit, and only tend to weaken the tree; the true blossoms generally appear in October or November, and the fruit ripens in April. It requires to be about ten years of age before it produces fruit.

*The Pear* has only once\* been known to bear fruit in lower Bengal, but, that one experiment having been successful, augurs well for future attempts, and holds out sufficient encouragement to those who are interested to pursue the cultivation of this delicious fruit; to this may be added that the pear has been successfully grown in the North-Western provinces, in Cashmere, &c. The cultivation is the same as for the apple, but it does not

\* In Mr. C. Steer's garden at Kishnagur.

require to be so old before it yields a good crop.

*The Quince* is only known in Upper India, where there are three varieties. But little is known of its culture as adapted to this climate; a moist soil is preferred by it, although in other respects resembling the apple and pear.

*The Rose Apple* bears a whitish yellow fruit of but little flavour, sweetish, and rose-scented, whence its name.

*Propagation* may be performed either by seed, or by slips and suckers.

*Soil, &c.* It will thrive in any moist soil, and requires no culture beyond pruning off the lower shoots, and occasionally digging around the roots. It produces fruit in March and April.

*The Loquat* is a highly esteemed juicy fruit, with a tough woolly outside skin of yellow colour when ripe; the flowers rise in spires from the extremities of the branches, on which the fruit afterwards forms in bunches.

*Propagation.* It may be raised from seeds, but the preferable mode is by layers.

*Soil, &c.* A rich, but rather moist soil is preferable for this tree.

*Culture.* When the layer has been planted

out for a season, the lower branches should be pruned off to promote the formation of an even, well formed head, and it should not be allowed to bear fruit until the tree be full five years old ; on attaining that age, when the blossoms open, a small trench should be dug round the stem, at the distance of about three feet, and this must be daily filled with water until the fruit begins to ripen ; little further is required, although it is well during the cold weather to apply fresh manure to the roots, decayed vegetable matter and cow dung being the best suited to the loquat. It fruits in February and March.

*The Jumrool* is an indigenous fruit of white colour, pear-shaped, and a highly polished surface, possessing little or no flavour ; the tree grows almost wild, and needs no particular cultivation.

*The Leechee* is a highly esteemed fruit, originally brought from China, but fully naturalized in India ; the outside is a stiff, rough, red dish skin, and the pulp is rich, sweet, and firm.

*Propagation* is performed by layers or Chinese grafting, and the plant easily throws out root fibres.

*Soil, &c.* A rich mould, not too dry, is the best suited to the leechée.

*Culture.* After the young plant is put into the fruit garden, it must be carefully watched to train the stem and remove the lower shoots and suckers, as this tree is much disposed to become crooked, straggling, and ill shaped. In the sixth year it may be allowed to bear a moderate portion of fruit, but till it attain that age the blossoms should be always removed as soon as they appear ; when bearing, the roots should be occasionally watered moderately ; the fruit ripens in March and April.

*The Longan* is in form somewhat similar to the leechée, (but smaller and more round) to which however it is very inferior in flavour, some people however like it. It requires little culture, and fruits in June.

*The Wampee* is a rough, brown-skinned fruit, having a strong flavour of turpentine, tempered with a slight degree of acid, rather grateful to the palate ; it fruits plentifully, without requiring any attention in cultivation, in almost any soil. The fruit ripens in June and July.

*The Mongosteen* is a rich flavoured, most highly esteemed fruit, the pulp being juicy

and of a red colour; it is very rare in India, though indigenous in Singapore, Penang, &c.

*Propagation* is sometimes performed by seed, but cuttings or layers are to be preferred, as some trees produce only male blossoms.

*Soil, &c.* A rich vegetable mould, on a dry rocky bottom, is the natural soil of this tree, which deserves more extensive introduction.

*The Custard Apple* is a general name for a class of soft pulped fruit of agreeable flavour, the chief varieties of which are—

1. *The Sweet Sop*, commonly called here by the general name of custard apple; the outside skin is thick, and divided into many compartments, the pulp sweet and luscious, and filled with small black long-shaped seeds.

2. *The Bullock's Heart*, as it is called, is coarse flavoured, and grows almost wild in a soil impregnated with salt, but requires a wet subsoil; it is seldom found out of Bengal.

3. *The Sour Sop* is very rare in India, but is well deserving of culture.

*Propagation* is effected either from seeds, cuttings, or layers.

*Soil, &c.* Any ordinary garden soil suits these trees, but they should be kept moist.

*Culture.* Little is required beyond attention



to the shape of the tree to form a well balanced head, and keep the roots clean from weeds. The fruit of the sweet sop ripens from June to October, whilst that of the bullock's heart is procurable at almost all seasons.

*The Sapota* is a fruit of rich smell and taste, the pulp being of a deep yellow colour, but not much known in India, where it deserves greater attention ; any rich garden mould suits this tree, which is propagated by cuttings or seed.

*The Alligator, or Avocado Pear*, is highly esteemed by some people ; the pulp is of firm texture and rich flavour, though few persons like it on first tasting it, yet it gains on the taste and becomes a favourite fruit with most.

*Propagation* is performed by sowing the seeds, and afterwards removing the plant to the spot it is permanently destined to occupy.

*Soil, &c.* Any garden soil suits this tree.

*Culture.* None is required beyond trimming off the lower shoots ; it takes seven or eight years before it will produce fruit, and is even then but a moderate bearer, producing at the extremities of the branches only.

*The Jack* grows on a large tree, the fruit issuing by short stalks direct from the stem,

but the strong disagreeable smell is sufficient to make it little sought after by Europeans.

*Propagation.* Suckers produce the best plants, but it may be raised from seed or layers.

*Soil, &c.* A rich soil is most sought for by this tree.

*Culture.* None is required.

*The Guava* is an esteemed fruit both for the dessert and for jelly, but most of those grown in India have a strong scent, disagreeable to most people. There are several varieties, of which the pale yellow kind, and irregular pear-like shape is the handsomest, but the small West India, or strawberry guava, is the best, being extremely delicate in flavour.

*Propagation.* It is increased by sowing the seeds of approved fruit, and transplanting the young plants when about six inches in height.

*Soil, &c.* A good garden mould is all the guava requires, occasionally in the cold season manured by putting the soil from the bottom of tanks around the root.

*Culture.* These trees require frequent pruning, as they are apt to grow very straggling. They are abundant bearers, and begin to give fruit in the third year after they are sown.

*The Pomegranite* is by some much admired,

particularly the large red seeded kind, grown in upper India. The fruit has on the outside a hard woody rind, very astringent, and covering a mass of seeds surrounded by a juicy sub-acid pulp.

*Propagation* is effected by cuttings, suckers, or layers, the last being the best mode.

*Soil, &c.* It requires a rich, but at the same time a rather sandy soil.

*Culture.* The pomegranite requires much pruning, and the centre shoots being kept thinned out, or it will soon get crowded and straggling, with a quantity of useless wood.

#### THE ORANGE TRIBE

contains several leading species, subdivided into many varieties.

*The Orange* is a well known and favourite fruit, the pulp sweet, juicy and grateful, and the rind highly aromatic, whilst its blossoms distilled produce what is called 'orange flower water,' so useful in cookery, medicine, and as a perfume. The varieties known here are the green Sylhet, the China, and the Lisbon; the

last has a thick woolly skin, and is later, and at the same time less juicy, but sweeter than the others, of which the best flavoured is the green Sylhet, also the earliest, coming into season in November. The orange grows chiefly in the eastern parts of India, and is seldom found in other parts.

*Propagation* is best performed by grafting on stocks raised from seed.

*The Citron* forms an excellent, well flavoured preserve, and of the juice is made lemonade. The fruit grows here to a very large size, the outer rind rough and full of excrescences, and when ripe of a bright yellow colour, and highly fragrant. This plant is found in all parts of India.

*Propagation* is performed by seed or layers; the latter, being the most expeditious, is generally preferred.

*The Lemon* need hardly be described; there are many sorts, of which the long Portugal lemon is the best; it grows to a large size, and has abundance of juice of a mild acid flavour.

*The Lime* stands second only to the preceding in estimation, the acid of the juice is sharper, and its form is round; the dark green kind being the most esteemed.

*Propagation* should always be effected by layers, which very quickly throw out root fibres.

*The Shaddock* is the largest fruited of the orange tribe, and the fruit is held in high esteem for its mild sub-acid flavour, excellent for quenching thirst. There are many varieties, of which those having a reddish pulp are to be preferred.

*Propagation* may be performed by seed, but it is chiefly used to obtain new varieties or stocks to graft on; the best method of increasing this tree is undoubtedly by grafting, but the most expeditious is by layers, which is consequently the mode generally resorted to.

*Soil, &c.* A stony yellow clay, richly manured with vegetable mould and well rotted cow dung is the best soil for all the orange tribe.

*Culture.* The whole tribe require active pruning, as they are rapid growers, and soon become crowded if not thinned out carefully to admit the sun and air; they begin producing fruit on the third or fourth year.

*Insects.* The plant louse, the red spider, and the large black ant are great enemies to this class of fruit trees; smoking with dried grass or tobacco is the best mode of destroying them.

## PULPY FRUITS.

*The Fig* is a luscious dessert fruit, deserving a place in every well ordered garden. There is only one variety known in India, and that is rather a small kind; it is desirable therefore that new sorts should be imported from the Cape, or elsewhere.

*Propagation* may be effected in any way, but that most generally approved is by layers, which root in less than a month in the rains.

*Soil, &c.* This tree thrives in all soils that have not too wet a sub-soil, but they produce the most good fruit in a strong loamy soil, the tree also requires a free open air.

*Culture.* The moist climate of Bengal causes the fig to throw out shoots so rapidly as to prevent its maturing its fruit; this must be checked by drainage and pruning; the ends of the long straggling branches should also be broken off frequently to cause them to put out strong fruit-bearing shoots, and the fruit should be thinned to not less than six inches apart on the bearing shoots; when the fruit begins to swell, which it will do in the month of April or May, it should be protected by small tin boxes made either in bars or pierced

with holes, to give free access to the air, this will cause them to grow to a larger size, and prevent their ripening prematurely. In the cold weather the superabundant side shoots should be removed, and the roots opened and supplied with fresh well rotted vegetable manure ; the trees produce fruit in the second year.

*The Plantain Tree* is too well known to need a description, but there are several varieties, the larger kinds requiring to be dressed as a vegetable to become palatable, the kind eaten as a fruit being more properly called the *banana*, of which the sort known as the *China chumpah* is the most esteemed.

*Propagation* is by suckers, of which the tree gives an abundant supply.

*Soil, &c.* Any soil moderately rich will suit the plantain.

*Culture.* No particular care is required, but it is advisable to keep the ground near the roots tolerably free from weeds, and occasionally to earth them up with soil from the bottom of a tank ; old stems should also be removed as soon as the spire of fruit is cut off.

*The Pine Apple* is, when properly cultivated, one of the finest fruits of the garden, but from

neglect, has fallen to be so deteriorated in India as to be hardly desirable as a fruit.

*Propagation* is performed by planting the tops or offsets, which speedily take root.

*Soil, &c.* No soil can be too rich, and no manure too strong for the pine apple.

*Culture.* The plants should be put in, in rows two feet asunder, and the rows about four feet distant from each other, and the earth well drawn up to the stems; in the third year they will begin to produce fruit, and as soon as the blossoms appear, which will be in February, the roots must be laid open, and all side shoots and suckers carefully removed to plant out for a fresh supply of plants, if desired; a basket of rotted cow dung should then be put to each plant, and above that the like quantity of fresh stable dung, with the litter, covering the whole; this will form a ridge about the stem, over which place a thin layer of earth; a trench should then be dug on each side of the plants, and these must be every day filled with water, a moderate quantity being also thrown from a fine rosed watering pot once a week over the leaves and fruit. The fruit will ripen in May, and by pursuing the method here recommended, pines may be obtained of as large size and



as high flavoured as the finest procurable with the utmost care in any part of the world.\* The stem producing the fruit should be removed when the fruit is cut, and a new shoot encouraged, and no offsets should be allowed to remain round the base of the fruit whilst it is growing, as they draw off the nourishment and deteriorate the flavour.

*Insects, &c.* The spider is the most troublesome, and should be removed whenever observed; snakes and lizards also attack the fruit

whilst ripening, and must therefore be closely looked after and destroyed, as they approach the pinery.

#### BACCIFEROUS FRUITS.

These are numerous and highly esteemed, comprising the most delicate portions of the dessert.

*The Grape Vine* ranks the first among this class of fruits; it is a hardy plant, reaching to a very great age, and containing numerous varieties, of which those known here, are—

\* In my brother's garden, in the year 1839, pines were grown weighing  $7\frac{1}{2}$  lbs. each, exclusive of the top.

1. *The White Muscadine*, most commonly cultivated, producing middling sized bunches of small round fruit, rather crowded unless thinned out, the flavour sugary and rich, and the plant an abundant bearer, requiring comparatively little attention.

2. *The Black Muscadine* is less common than the white, and the fruit rather smaller, but in all other respects, except colour, resembling that.

3. *The Cashmere*, or as it is called in England, *the white Portugal*. The bunches are large and loose, and the fruit also large and long shaped, hard-skinned, and sweet slightly mixed with acid; this grape keeps a long time after ripening, and is commonly packed in cotton in small boxes that are sent to all parts of India.

4. *The Malaga* has been lately attempted to be introduced by seed from America; the bunches are large, as is also the fruit; besides being firm and delicious flavoured, it is generally considered indeed one of the finest and richest grapes in existence, and deserves attention.

5. *The Constantia*, originally from the Cape, is of a black and purple variety, though there

is also a white kind, but not so deserving of cultivation as the dark; the bunches, as well as the fruit, are of medium size, the latter of a rich flavour; the plants are somewhat delicate, and the leaves of very large size.

6. *The Muscatel* has been introduced from the Cape; the bunches are of medium size, the berry large, round, and transparent, and very luscious and saccharine; it is but a moderate bearer.

*Propagation.* The vine is raised by seed, layers, cuttings, or grafting; the first mode is pursued if it be wished to obtain an esteemed variety where cuttings are not to be procured; but if adopted with the intention of producing new varieties, blossoms must be impregnated by the pollen of some other sort; layers produce strong showy plants the first year, but cuttings are to be preferred for getting plants with well formed tops, proportioned to their roots.

*Soil, &c.* The vine thrives in any soil having a dry bottom; in that which is rich and deep it will grow luxuriantly, and produce an abundance of large sized fruit; but in shallow, dry, or chalky soil the produce is of better flavour, though rather less in quantity. Manure

should not be put to the roots too fresh, but should have good time to get mellowed before being applied; but when old, blood, offal, horn, bone dust, leather, are all of benefit; or fresh fish and oil cake applied at a distance from the roots is a good plan.

*Culture.* In planting out, the vine should be placed so as to be protected from the easterly or other strong wind in a sheltered position; and where such is not otherwise obtainable, it will be well to make a subsoil of stones, bricks, broken pots, shells, bones, &c. with a small portion of lime, as such are much desired by the young fibres and lower shoots of the roots; the best time for planting out being during the rains; and in this operation it is best to reduce the young plant to not more than two feet in length, rubbing off all but three buds. In the beginning of the second year select the strongest of the three shoots that the buds reserved will have produced, and cut off the other two, rubbing off at the same time any superfluous shoots or buds that may have appeared, and in September cut down the vine to two buds again; any blossoms that appear in the third year must be removed at the close of the rains; the tree should be again cut down

to three or four buds. Should any blossoms appear in the following March (the fourth year) they should be pinched off, and the tops of the shoots, as they reach any length, must be taken off or bent down to check their growth. As the girth of the stem will at the close of the rains have attained fully three inches, preparations may be made for the tree bearing in the following season, and to this end the two shoots that are to remain must be cut down to seven buds on each, and if the bark of the stem be decayed it should be rubbed off clean; then bend down the shoots retained, and secure them in a horizontal position, cutting out all the buds that by this means are placed underneath; as the shoots from those that are uppermost appear, let them be trained as directed for climbing plants; and if more fruit appear than is equivalent to the scale shewn below, let it be cut off as the berries set. When the fruit is gathered (the fifth year) or at the close of the rains, cut the two shoots nearest the stem on each side, to as many buds as may be necessary to give the required quantity of fruit for the next year; and all other shoots to one bud only, pulling off the loose bark from the stem (sixth year.)

In December or January train the two shoots reserved to fruit the tree carefully, and as they appear train also those issuing from the other reserved buds, and henceforth pursue this system of training two shoots for the succeeding year, and fruiting from two shoots alternately. At this period too the root should be laid bare, washed, and all decayed or unhealthy fibres pruned out, allowing the roots to remain open until the leaf buds begin to swell, when they should be filled in with good vegetable mould and a supply of well rotted manure or fish, dug in at a distance of two feet from the stem of the tree, which process must be repeated every year.

The following scale for bearing fruit on vines being clear, and well adapted to their culture in this country, I have extracted from a recently published work as an useful guide.

“Scale of the greatest quantity of grapes, which any vine can perfectly mature, in proportion to the circumference of its stem, measured above the ground.

<i>cir.</i>	<i>lbs.</i>	<i>cir.</i>	<i>lbs.</i>
3 inches	5	7 inches	45
3½	10	7½	50
4	15	8	55
4½	20	8½	60
5	25	9	65
5½	30	9½	70
6	35	10	75
6½	40	10½	80

“ It will be seen, that if 2½ inches be deducted from the circumference of the stem of any vine, the capability will be equal to the maturation of ten pounds of grapes for every remaining inch of girt. The proportionate quantity for fractional parts of an inch may be easily calculated.

“ No vine is taken cognizance of until its stem measures three inches in girt, as, under that size vines ought never to be suffered to ripen any fruit.

“ The manner in which it is intended that this scale should be applied, is to measure the stem of a vine at the autumnal pruning, and to retain no more good well-ripened fruit buds, than is supposed necessary to produce the given weight of fruit that corresponds

“ to its girt ; and I consider every bud, reject-  
 “ ing the two bottom ones on each shoot, as  
 “ equal to the production of half a pound  
 “ weight of fruit.”\*

*The Mulberry* of India is a poor vapid fruit, of extremely easy culture ; but it is most desirable that attention should be paid to the induction of better varieties.

*Propagation* is performed by cuttings, which strike easily in moist ground.

*Soil, &c.* Any tolerably moist soil will answer for the mulberry of India, but the better sorts delight in rich sandy loam.

*The Raspberry*, of good flavour and size, is abundant in the hills, but will not succeed in the plains, the heavy rains abstracting all flavour from the fruit. There are two varieties, the small crimson fruited, of very rich flavour, and the large red.

*Propagation* is performed by planting out the young sucker shoots, which rise plentifully from the root ; new varieties are obtainable from seed.

*Soil, &c.* Although the flavour of the fruit suffers from superabundant moisture, yet this

\* A Practical Treatise on the Cultivation of the Grape Vine, by Clement Hoare.



shrub requires a moist soil, which should be a rich loam, well manured with vegetable mould, and rather sandy, on a dry stony bottom.

*The Strawberry* is universally esteemed as one of the most delicious of fruits, of which there are numerous varieties; the pine and hautboy are to be preferred; the small scarlet is, however, the most commonly found.

*Propagation.* The plant rapidly multiplies itself by numerous runners and suckers, each of which, if planted out, will produce fruit the same year; seed produces new varieties.

*Soil, &c.* They thrive best in a light soil well treated with strong manure, such as fresh stable, or what is preferable, pig-dung.

*Culture.* Strawberries should be replanted every year. As soon as the rains subside, raised beds, on a dry, well drained subsoil should be prepared, and strongly manured with pig's dung; in these the young plants are to be put out in clumps of five each, at about eight inches between each plant, four plants being placed diamond fashion, and the fifth in the centre, these clumps being about a foot distant from each other; they should be watered every third day, and when the blossoms ap-

pear it will be well to give a moderate supply morning and evening, taking care that no water lodge in the joints of the stools or leaves; the fruit ripens in February or March.

*The Winter Cherry*, a species of which called *tipparee* is eaten in some parts of India, is a fruit of pleasant sub-acid taste, growing on a small straggling plant, about two feet in height, which should be put in a distant corner of the garden, as it is an ugly looking plant, that once established soon runs into a complete jungle, very difficult to eradicate.

*Currants* and *Gooseberries* have not yet been successfully cultivated in India, and will yet afford sources of amusing experiment to the speculative horticulturist. The attempts made hitherto by the curious to introduce these fruits, although they have failed, yet afford encouragement. The author has seen the plants brought from England, but they have been killed, in his opinion, by over carefulness, being kept constantly covered with mats during the rains to protect them from an excess of moisture; but this covering confining the vapour that naturally forms from the action of a hot sun on the moist ground, formed an unnatural and unwholesome atmosphere around the plants,

that produced mildew, and finally rot, destroying them after they had been about six months in the ground ; but the continuance for so many months, comprising the whole of the hot weather, augurs well for future attempts made with *less care*. Another attempt occurred within the author's knowledge with seed imported from Hobart Town, which arriving in May was immediately sown in pots under shelter, watered daily ; but the seed did not germinate until the beginning of November, when it came up abundantly, and continued to thrive until the following May, when the gardener, to take care of them and keep them out of the sun, put the plants, then about eight inches high and well covered with leaves and young shoots, into a dark godown, where the want of light and air destroyed them.

*The Nut Tribe* are little known in India, but they are of easy culture, and deserving attention by those who are permanent residents in the country ; the long time they require to come to the maturity necessary for production of fruit, making them of little interest to the mere sojourner ; the walnut and chesnut of a small kind abound in the hills.

## CUCURBITACEOUS FRUIT.

*The Melon* needs no description in a country where it grows so commonly as India. There are several varieties of the sweet melon cultivated here, the most remarkable being the *common musk melon*, the *nutmeg melon*, the *sweet melon of Ispahan*, the *Cabul melon*, the *large Istumbol melon*, and the *Bokhara melon*.

*The water melon* is a very refreshing fruit, of which the best is the *large round water melon* (that from American seed being the best) the *pink Cabul water melon*, and the *Persian water melon*.

*Propagation* is by seed sown where the plants are to fruit, for though many people transplant them, the plants are never so healthy, or the vines so strong, as when they remain where sown; seed should not be too new, as if less than two years old it is apt to run too much to vine, and to produce only male flowers. The seed must be sown from the beginning of February to the middle of April.

*Soil, &c.* The soil can hardly be too sandy, manured thickly with a compost of two parts old well rotted cow dung, one part stable manure, and one part sand dug into the soil

to a depth of not more than six inches, a layer of about two inches of sand being laid over the bed. Before sowing the seed the beds should be moistened, and the seeds put in holes not less than six (eight is better) feet apart, at a depth of an inch and a half.

*Culture.* When the seed leaves fall off or wither, the plants must be thinned so as not to leave more than four plants in each hole, at the same time the leading shoot must be pinched off to encourage the lateral shoots. As those advance, they should be pinned down at intervals with small wooden pegs to prevent their interference with each other or being blown about by the wind, and the earth must be brought up about the stems. Such shoots as produce only male blossoms must be cut out. When the fruit blossoms open it is advisable to assist the setting of the fruit by impregnating them with the male blossoms. As the fruit increases to the size of an egg it should have a tile or potsherd placed under it to protect it from any dampness in the earth, or the late sown melons had better be raised on a low muchan, to prevent their being injured by the rain; during the whole time of their growth the plants should be

watered daily; the fruit ripens from the middle of April to the middle of June.

*Insects.* The melon is subject to the ravages of a red beetle, commonly called the soldier, that destroys the leaves and young shoots, these should be carefully removed by the hand and destroyed.

*The Cocanut*, the *Date*, the *Bêlé*, and other common native fruits seldom sought by Europeans, are not described here, as they require no particular culture or soil, and are well known to every one.

### **The Shrubbery.**

The ornamental shrubs and trees are very numerous; the universal favourite, and deserving of the first notice in a work like this, is the rose, beautiful and admired in all its varieties.

*The Rose.* In Europe they number from a thousand to fifteen hundred varieties; of the rose in India, the cultivated sorts are limited to the *Madras rose*, the *rose Edward*, the *sweet scented Bussorah rose*, (red and white) the *Persian rose*, the *sweet briar*, the *many-flow-*

*ered rose*, (a climber,) *the China rose*, (red and damask,) and *the dog rose* (growing wild); *the moss rose* may be found to exist, but has not, it is believed, been yet known to blossom in India.

*Propagation.* All kinds may be multiplied by seed, layers, cuttings, suckers, or grafts, almost indiscriminately. The seed of the rose contained in the hip requires a very long time to germinate; they should be sown moderately thick, in a soft moist soil composed of vegetable mould and sand, and kept moist in a shady situation. Layering is the easiest and most certain mode of propagating this most beautiful shrub, and these should be put down at the commencement of the rains; the layers must be slit lengthways up the centre of the branch to facilitate the formation of root fibres; they take about two months to root, during which any blossom buds that appear must be carefully rubbed off; when separated from the stools they should be planted out in a nursery, where however they must not be allowed to blossom. The roots that branch out and throw up shoots may be divided or cut off from the main root, or even an eye thus taken off may be made to produce a good plant.

Suckers, when they have pushed through the soil, may be taken up by digging down to, and gently detaching them from, the roots. Grafting, or budding is used for the more delicate kinds, and for the sweet briar, and by the curious, may be employed to produce two or more varieties on one stem, the best stocks being obtained from the China, or the dog rose.

*Soil, &c.* Any good garden soil suits the rose.

*Culture.* The Rose Edward, the Madras and the Bussorah rose should be planted out in a rich, but not too light soil, at the close of the rains; the branches should be cut down to not more than a foot in length, removing at the same time all old and decayed wood; the roots should then be laid open, cleaned and pruned, and allowed to remain open until blossom buds begin to appear at the end of the first shoots; the hole must then be filled with good strong stable manure, and slightly earthed over—about a month after, a basket of stable dung with the litter should be heaped up round the stems, and bricks or turf placed over it, to take off the unsightly appearance; while flowering, too, it will be well to water



with liquid manure at least once a week. If it be desired to continue the trees in blossom, the shoots should be removed as soon as they have done flowering. To secure full large blossoms, all the buds from a shoot should be cut off, except one, when quite young.

The sweet briar strikes its root deep, and prefers shade, the best soil being a deep rich loam, rather strong than otherwise; it will be well to place a heap of manure round the stem, above ground, covering over with turf, as for the rose Edward, &c.; but it is not requisite to open the roots, or give them so much manure. The sweet briar must not be much pruned, or it will not blossom, and it is rather slower in throwing out shoots than other roses. In this country the best mode of multiplying this shrub is by grafting on a China rose stock, as layers do not strike fully, and cuttings cannot be made to root at all.

The many-flowered rose is a climber, and though not needing so strong a soil as other kinds, requires it to be rich and frequently renewed, by taking away the soil from about the roots and supplying its place with a good compost of loam, leaf mould, and well rotted dung. They require shelter; this, if

carefully trained, they will form for themselves ; but until they do so, it is impossible to make them blossom freely ; the higher branches should be allowed to droop, and if growing luxuriantly and the shoots not shortened, they will produce the following season bunches of flowers at the end of every shoot, and have a very beautiful effect ; no pruning should be given except what is just enough to keep them within bounds, as they invariably suffer from the use of the knife ; they are easily propagated by cuttings or layers, both which root readily.

The China rose thrives almost anywhere, but is best in a soil of loam and peat, a moderate supply of water being given daily during the hot weather. They will require frequent thinning out of the branches ; and are propagated by cuttings, which strike freely.

Rose trees look well in a parterre by themselves, as well as a few distributed along the borders.

*Insects, &c.* The green and the black plant louse are great enemies to the rose tree, and whenever they appear, it is advisable to cut out at once the shoot which they attack ; the green caterpillar too, often makes skeletons of the leaves in a short time ; the lady bird,

as it is commonly called, is an useful insect and worthy of encouragement, as it destroys the plant louse.

*The Pelargonium*, commonly called by most people the *geranium*, is a well known and favourite shrub, of which but few of the numerous varieties are known in this country, these are the *common scarlet*, the *crimson*, the *lemon*, the *oak leaved*, the *mango scented*, the *balm scented*, and the *rose*.

*Propagation* may be performed by seed to multiply or produce fresh varieties, but the ordinary mode of increasing the different sorts is by cuttings, no plant growing more readily by this mode; they should be taken off at a joint where the wood is ripening, and put into a pot with a compost of one part garden mould, one part vegetable mould, and one part sand, and then kept moderately moist and in the shade until they have formed strong root fibres, when they may be planted out into separate pots.

*Soil, &c.* A rich garden mould, rather sandy than otherwise, is desirable for this shrub.

*Culture.* Most kinds are rapid and luxurious growers, and it is necessary to pay them constant attention in pruning or nipping the

extremities of the shoots, or they will soon become ill-formed and straggling; and this is particularly requisite during the rains, when heat and moisture combine to increase their growth to excess. At the close of the rains, the plants had better be put out into the open ground, and closely pruned, the shoots taken off affording an ample supply of cuttings for multiplying the plants; this putting out will cause them to throw out strong healthy shoots and rich blossoms, but as the hot weather approaches, or in the beginning of March, they must be replaced in moderate sized pots, with a compost similar to that required for cuttings, and placed in the plant shed formed with a frame roof, over which mats or canvas may be drawn during the heat of the day, or on the occurrence of a heavy fall of rain, left open at night and until the sun acquires an excess of heat in the morning; the earth in the pots should be covered with pebbles or pounded brick, of moderate size, which prevents the accumulation of moss and fungi.

*The Honeysuckle*, and other climbing plants, are all propagated by layers, cuttings, or suckers, and seeds should not be resorted to if these are procurable, as they are very slow

and uncertain in germinating; layers or cuttings should be trimmed down to not more than a foot in length in the spring, or the beginning of the rains, and kept moist till they cease, by which time they will be found to have formed strong healthy root fibres, and fit for removal.

*Culture.* The form of training should be carefully preserved by tying up or removing the shoots as they extend their growth, and a good pruning given at the close of the rains, following it up by thinning out in February or March, attention being paid to the mode of producing flowers in each individual plant, as being, from the lateral joints or from the ends of the shoots as the shortening of them so advisable to strengthen and increase the blossoms in the former case, would, in the latter, deprive the shrub of all its hoped for flowers.

*The Hardy Shrubs* all requiring a nearly similar cultivation, it will suffice to give general directions.

*Propagation.* The seeds, where that mode of multiplying kinds is resorted to, should not be kept too long, as they often become too hard to germinate. The best time for sow-

ing is on the close of the rains, the larger ones being covered to a depth of an inch, and the smaller more lightly; they generally at first grow slowly, being apparently too much occupied in forming root to spare any strength for super growth. Layering should be performed when the young shoots are most vigorous in growth, which will generally be found in India to be at the commencement of the rains, and they will be commonly ready to move at their close, if not sooner; indeed some of the trailing kinds root so readily that merely putting a little earth upon a branch for a couple of weeks, will suffice to render them fit to remove; for the more woody kinds, and those difficult to root, it will be well to make a slight cut round the bark with a knife, so as to divide, without removing any of the bark. Suckers are thrown up by very many shrubs in great abundance, and these, carefully removed close to the root or stem, will readily root in a moist soil, or if the earth be cleared away, and a notch made in the sucker as it stands, on again covering it with soil it will speedily root, while still deriving nourishment from the parent tree. This last is a surer way of obtaining plants from

suckers. Cuttings taken from wood of a year old will, in certain shrubs, be found the readiest way of multiplying their kind; some will root easily in a moist soil at any time of the year, but the best period is the beginning of the rains, in a sheltered situation, as too much wet would produce canker and rot before the fibres have sufficient time to form.

*Soil.* A rich light loam suits most shrubs, though there are some few that thrive best in a poor hard soil: experience will point out these.

*Culture.* When dwarf, round, and bushy plants are required, the tops of seedlings should be nipped off when a few inches high, the like effect being produced from shortening the leading shoots of layers, suckers, or cuttings. The best time for transplanting most young shrubs is in the beginning of the rains, as vegetation is most vigorous during their progress; the removal however of the more delicate species, and of European exotics, is better deferred until the close of that season, as too much moisture is likely to occasion injury to them. During the hot season delicate shrubs are benefited by having the earth for some distance around the stem covered with

turf or straw to preserve the moisture as much as possible, and the surface should be frequently stirred with the Dutch, or pronged hoe in the immediate vicinity of the stem ; all branches that overhang each other, or crowd the centre and prevent a free circulation of air should be thinned out with the pruning knife, or the plants will get straggling and unsightly ; but beyond this, shrubs require little attention. The arrangement of the contents of the shrubbery depends so entirely upon individual taste, that no general rule can be laid down to suit all persons ; practice and attention must be the guide to direct in this respect.

### **Flower Garden.**

The Flower Garden contains all the several descriptions of ornamental border plants, whether *perennial*, or lasting, *biennial*, or of two years' duration, or *annual*, of only one season's continuance. It claims, alike from its beauty and the care it requires, to be nearest to the house, and it needs shelter from strong winds and storms ; it should contain a portion of turf or



lawn of well kept grass, interspersed with ornamental patches and borders of flowers of various hues, to contrast with its fresh green hue ; the best for this purpose is what is known in India as the dhoop grass, kept frequently clipped with the garden shears, and occasionally watered in the dry weather. If any subdivision be employed, or it be deemed desirable to fence it off from the shrubbery or other part of the garden, a light ornamental railing should alone be made use of for that purpose. The utmost possible care should also be taken of the paths, which are best made of kunkur, but if of broken brick, the pieces should be small and of even size, frequently raked, and kept free from weeds. On each side of the flower garden should be constructed sheds with open roofs, to be temporarily covered with mats or canvas, for reception of the delicate plants or flowers in pots, so that they may be sheltered from the fiercer rays of the sun, or the more violent rain, and at the same time by removal of the temporary covering be readily exposed to the gentler showers and dews, and the mild genial rays of the early morning sun. Attention should be paid to the height of flowers in the borders, so as to have

the tallest at the back, distant from the path, and gradually decreasing to the front or edge of the border, in which taste may be displayed in the arrangement of colours so as to produce the best effect when in blossom, as well as to have mingled together such as flower at different times to keep up a succession of beauty: to enter fully upon this would however far exceed the limits of this work, and it must therefore rest with persons to form their own plans for securing the best success they can in this the most elegant branch of horticulture.

*Decorations* are but little attended to in India, where however they might be more easily and cheaply contrived than perhaps any where else by the fanciful forms for baskets, rustic work, props, or trellises, which the pliant nature of the bamboo and the ratan allow of being assumed. Elegant vases, dwarf pillars, &c. may be made of red earth, by a little instruction to the common potter, and afterwards painted at very little cost, and these form an elegant decoration; to which, by those who can afford it, might be added imported plaster figures, &c. as also China seats, flower pots, or other ornaments.

## SELECT FLOWERS.

*The Anemone*, a rare flower in this country, and only grown in pots hitherto, is nevertheless worthy of more attention. The stem of a fine anemone should be about nine inches in height, strong and upright, the flower ought to be not less than two inches in diameter, the outer petals broad, rounded at the tip, rising horizontally from the base, and gradually turned up at the centre, forming a cup within which the small narrow petals should lay regularly over each other, the stamens not being prominent.

*Propagation.* Seed is only resorted to for the purpose of producing varieties, or when other means are not available. Dividing the tuberous roots is the usual mode of cultivating this beautiful flower: these have been successfully imported from Hobart Town.

*Soil, &c.* A strong rich loamy soil is preferable, with a considerable portion of well rotted cow-dung, dug to a depth of two feet, and the beds not raised too high, as it is desirable to preserve the moisture in the

subsoil; if in pots, this is effected by keeping a saucer of water under them continually, the pot must however be deep, or the fibres will have too much wet: an open airy situation is desirable.

*Culture.* When the plant appears above ground the earth must be pressed well down around the root, as the crowns and tubers are injured by exposure to dry weather, and the plants should be sheltered from the heat of the sun, but not so as to confine the air: they require the morning and evening sun to shine on them.

*The Crocus* has yet, it is believed been hardly ever known to flower here, even with the utmost care: a good crocus has its colours clear, brilliant, and distinctly marked.

*Propagation* must be effected for new varieties by seed, but the species are multiplied by offsets of the bulb.

*Soil, &c.* Any fair garden soil is good for the crocus, but it prefers that which is somewhat sandy.

*Culture.* The small bulbs must be planted in clumps at the depth of two inches; the leaves should not be cut off after the plant has done

blossoming, as the nourishment for the future season's flower is gathered by them.

*The Narcissus* flowers tolerably freely in many parts of India; a good narcissus has a strong erect stem, is regular in form both of the petals and the cup, and the whole of the blossoms open at the same time.

*Propagation* is by offsets taken after the close of the rains, and planted out separately: they will not flower however before the third year.

*Soil, &c.* The best is a fresh light loam, mixed with very old cow dung.

*Culture.* An eastern aspect, sheltered from the sun after the morning, is to be preferred, in pots not too much watered, and the soil covered with pebbles or broken brick to keep the roots cool and free from moss; all weeds must be carefully removed as they appear: it blossoms from the end of January to the end of March.

*The Iris.* The *Iris chinensis* is a pretty many-flowered plant of pale blue colour, introduced here from China.

*Propagation* is performed by dividing the roots.

*Soil, &c.* Any common garden soil suits the iris.

*Culture.* It thrives best in a cool, moist, shady situation; the ground must not be stirred near it during the cold weather, or until it flowers in March or April.

*The Ixia* is originally from the Cape, and belongs to the class of Iridæ: the *ixia chinensis*, more properly *morea chinensis*, is a native of India and China, and common in most gardens.

*Propagation* is by offsets.

*Soil, &c.* The best is of peat and sand, it thrives however in good garden soil if not too stiff, and requires no particular cultivation.

*The Lily* is well known, the orange kind being common in most gardens.

*Propagation* is effected by offsets.

*Soil, &c.* Any common garden soil will suit this plant: it forms a good border flower, and requires no peculiar cultivation.

*The Amaryllis* is a handsome flower, several kinds of which have become naturalized border flowers in India.

*Propagation* is by offsets of the bulb, which are thrown out freely in most varieties; the most usual kind (*Reginæ Mexicanis*) giving in one season as many as eight or ten new plants.

*Soil, &c.* A sandy loam, moderately manured with rotted stable dung; if in pots, the

bottom should be filled with broken brick to keep them from being exposed to rot by the excess of moisture arising from the emersion of the pot in a saucer constantly filled with water, which is advisable to promote the growth of the plant, and its free blossoming.

*Culture.* The beds should be planted in rows with small trenches between them, which should be filled with water every day during the dry weather. The finer varieties, as the *formosissima*, the *cyrtanthoides*, &c. should be kept in pots, all the others may be planted out without risk in any part of the border, they look best however in beds, which when in blossom have a very rich appearance. The varieties introduced from China blossom either during or at the close of the rains, the border sorts flower in February, and the choice kinds in March and April.

*The Tube Rose* being a native of India thrives in almost any soil, and requires no cultivation : it is multiplied by dividing the roots.

*The Lobelia* is found in many gardens, and is a showy flower, well worthy of culture.

*Propagation* is best performed by offsets, but seeds produce good strong plants.

*Soil, &c.* A moist, sandy soil is requisite for

them, the small varieties especially delighting in wet ground; some of these are annuals, and the roots of no varieties should remain more than three years without renewal, as the blossoms are apt to deteriorate; they blossom during the rains.

*The Pitcairnia* is a splendid flower, lasting long in blossom, which appears in July or August.

*Propagation* is by dividing the roots, or by suckers, which is best performed at the close of the rains.

*Soil, &c.* A sandy peat is the favourite soil of this plant, which should be kept very moist.

*The Dahlia*, or as it is now the fashion to call it the *Georgina*, is a border flower of great beauty and variety, that should hold a permanent position in every garden. The flowers should be fully double, always filling the centre well; the florets entire, regular in their disposition, bending back so as to form a globular shape, by each series over-lapping the other; the stalks strong, and long enough to shew the flower free from the leaves. The varieties most common in India are the crimson, the scarlet, the orange, the white, and the purple; the introduction of others, which might



be easily effected by importing fresh tubers, is most desirable.

*Propagation* is by dividing the roots, by cuttings, or by seed ; the latter is generally resorted to where new varieties are desired.

*Soil, &c.* They thrive best in a rich loam, but should not be repeated too often on the same spot, as they exhaust the soil considerably.

*Culture.* The dahlia requires an open, airy position, and should be planted out where they are to blossom, immediately on the cessation of the rains, and as they grow should be trimmed of the lower shoots to about a foot in height, and either tied carefully to a stake, or what is better, surrounded by a square or circular trellis, about five feet in height ; as the buds form they should be trimmed off so as to have but one on each stalk, this being the only method by which to secure full, large, and perfectly shaped blossoms ; some people take up the tubers every year in February or March, but this is unnecessary. The plants blossom in November and December in the greatest perfection.

*The Carnation* is almost naturalized in India, and at once adds fragrance and beauty to our

gardens; the only variety found here however is the crimson.

*Propagation* is performed by layers, or pipings; the best time for making the former is when the plant is in full blossom, as they then root more strongly. In this operation the lower leaves should be trimmed off, and an incision made with a sharp knife, by entering the knife about a quarter of an inch below the joint, and passing it through its centre, it is then pegged down with a hooked peg, and covered with about a quarter of an inch of light rich mould; if kept regularly moist the layers will root in about a month's time, when they may be taken off and planted out into pots in a sheltered situation, neither exposed to excessive rain or sun until they shoot out freely. Pipings (or cuttings as they are called in other plants) should be taken off from a healthy, free growing plant, and should have two complete joints, being cut off horizontally close under the second joint; the extremities of the leaves must also be shortened, leaving the whole length of each piping two inches; they should then be thrown into a basin of soft water for a few minutes to plump them, and then planted out in moist rich mould, not more

than an inch being inserted therein, and slightly watered to settle the earth close around them; after this the soil should be kept moderately moist, and never exposed to the sun. Seed is occasionally resorted to, to introduce new varieties.

*Soil, &c.* A mixture of old well rotted stable manure, with one-third the quantity of good loamy earth, and a small portion of sand, is the best soil for carnations.

*Culture.* The plants should be sheltered from too heavy a fall of rain, although they require to be kept moderately moist, and desire an airy situation. When the flower stalks are about six or eight inches in height they must be supported by sticks, and all the buds, but the leading one, removed with a pair of scissors if large full blossoms are sought for; the calyx must also be frequently examined, as it is apt to burst, and if any disposition to this should appear, it will be well to assist the uniform expansion by cutting the angles with a sharp penknife. If despite all precautions the calyx burst and let out the petals, it should be carefully tied with thread, or a circular piece of card having a hole in the centre should be drawn over the bud so

as to hold the petals together, and display them to advantage by the contrast of the white colour.

*Insects, &c.* The most destructive are the red and the large black ant, which attack, and frequently entirely destroy the root before you can be aware of its approach; powdered turmeric should therefore be constantly kept strewed around the roots of this flower.

*The Pink and Sweet William* are pretty ornamental plants, and may be propagated and cultivated in the same way as the carnation, save that they do not require so much care or so good a soil, any garden mould sufficing, and are more easily produced from seed.

*The Violet and Pansy, or Heart's Ease.* These are both, and especially the latter, rather scarce flowers, but admired by all; the former for its delicate fragrance, and both, for the beauty and delicacy of their blossom.

*Propagation* may be easily effected by seed, or by dividing the roots, but the pansy is rather difficult to preserve through the hot weather, whence it is better to treat it as an annual, and seek fresh seed every year.

*Soil, &c.* A rich vegetable mould, kept some-

what moist, over a cool stony subsoil, is natural to these plants.

*Culture.* It would be unsafe, except during the cold weather, to put these plants in the open ground, but they gain strength by so doing at that season in February; they ought therefore to be repotted, filling the pots about half full with pebbles, or the chippings of a stone mason's yard, and over that placing good vegetable mould, with a small admixture of sand; at the close of the rains the roots should be separated, and the plants again put out into the ground to blossom.

*The Hydrangea* is a scarce plant here, brought from China, and very beautiful when in blossom.

*Propagation* may be effected either by cuttings or layers.

*Soil, &c.* The soil most desired by the hydrangea is a black bog earth, mixed with well rotted leaf mould, and a small portion of sand. It is very covetous of moisture, and will soon absorb a large supply of water, which must therefore be freely given to these plants.

*The Stapelia* is a curious and most beautiful flower, comprising many varieties.

*Propagation* is most easy by cuttings, or offsets, which seldom fail to root.

*Soil, &c.* The soil should consist of one-half sand, one-fourth rotted stable manure, and one-fourth garden mould, in pots, the soil being covered with pebbles or broken brick.

*Culture.* All they require is to keep them within bounds, remove decayed portions, and not allow them too much moisture.

*Perennial Border Plants*, besides those included above, are very numerous; the directions for cultivating admitting, from their similarity, of the following general directions.

*Propagation.* Although some few will admit of other modes of multiplication, the most usually successful are by seed, by suckers or offsets, and by division of the root, the last being applicable to nine-tenths of the hardy herbaceous plants, and is performed either by taking up the whole plant and gently separating it by the hand, or by opening the ground near the plant to be divided, and cutting off a part of the roots and crown to make new plants, the section being either at once planted where they are to stand, or placing them for a short period in a nursery; the best time for this operation is the beginning of the rains; offsets, or suckers, being

rapidly produced during the rains will be best removed towards their close, at which period also seed should be sown to benefit by the moisture remaining in the soil.

*Culture.* Transplanting this description of plants will be performed to best advantage during the rains. The general management is comprehended in stirring the soil occasionally in the immediate vicinity of the roots; taking up overgrown plants, reducing and replanting them, for which the rains is the best time; sticking the weak plants, pruning and trimming others, so as to remove all weakly or decayed parts. Once a year, before the rains, begin digging the whole border one or two spits deep, adding soil from the bottom of a tank or river; in the cold weather giving a moderate supply of well rotted stable manure and leaf mould in equal portions.

#### THE BIENNIAL BORDER PLANTS.

*Propagation.* They are all raised from seed, but the finest double varieties require to be continued by cuttings. The seed should be sown as soon as it can after ripening, but if

this occur during the rains, the beds, or, perhaps better, pots, must be sheltered, removing the plants when they are a few inches high to the spot where they are to remain, care being taken in removing those that have tap roots, such as hollyhock, lavatera, &c. not to injure them, as it will check their flowering strongly ; the best mode is to sow these in pots, and transplant them with balls of earth, entire into the borders at the close of the rains. Cuttings of such as are multiplied by that method are taken either from the flower stalks, or root shoots early in the rains, and rooted either in pots under shelter, or in beds protected from the heavy showers.

*Culture.* Cultivation, after the plants are put out into the borders, is the same as for perennial plants.

#### ANNUAL BORDER PLANTS.

*Propagation.* These plants are all raised from seed put in the earth generally on the close of the rains, although some plants, such as nasturtium, sweet pea, scabious, wallflower, and stock, are better to be sown in pots about June or July, and then put out into the bor-



der as soon as the rains cease. The seed must be sown in patches, rings, or small beds, according to taste, the ground being previously stirred and made quite fine, the earth being sifted over them to a depth proportioned to the size of the seed, and then gently pressed down so that the earth shall closely embrace every part of the seed. When the plants are an inch high they must be thinned out to a distance of two, three, five, seven or more inches apart, according to their kind whether spreading or upright, having reference also to their size; the plants thinned out, if carefully taken up, may be transplanted to fill up any parts of the border where the seed may have failed.

*Culture.* Weeding, and occasionally stirring the soil, and sticking such as require support, is all the cultivation necessary for annuals. If it be desired to save seed, some of the earliest and most perfect blossoms should be saved for this purpose, so as to secure the best possible seed for the ensuing year, not leaving it to chance to gather seed from such plants as may be left after the flowers have been taken, as is generally the case with native gardeners if left to themselves.

The culture of the flower garden is closed with lists of such plants or shrubs, arranged according to their heights and classes, with the colours of their blossoms included, which it is presumed may be useful to the unpracticed horticulturist in laying out a garden. It was intended to have made separate lists of such ornamental plants, shrubs, &c. as are worthy of cultivation, indigenous to India, but this having been found impracticable to accomplish within the short time allotted to the completion of this work, general lists only have in consequence, been made of all plants known by the author to have place in our Indian gardens, without reference to the original source of their introduction; among these will be found some that are scarce, and only seldom met with: these are marked as 'rare' with the letter 'r,' and require most of them to be grown in pots under shelter.

## Border Plants.

### PERENNIAL.

#### UNDER ONE FOOT IN HEIGHT.

- Ajuga furcata*, blue. *Bugle, the forked.*  
*Anthericum nutans*, white. *Anthericum, nodding.*  
 ———— *fragrans*, do. ————, *Sweet scented.*  
 ———— *triflorum*, do. ————, *Triple flowered.*  
*Anemone* of various kinds *r. Anemone.*  
*Antennaria triplinervis*, white. *Antennaria, three nerved.*  
*Begonia picta*, pink. *Begonia, the painted.*  
*Cactus mammillaris*, white. *Prickly pear, red spined.*  
 ———— *stellaris*, red. ————, *Hoary.*  
*Careya herbacea*, red. *Carey's plant, herbaceous.*  
*Conanthera campanulata*, blue *r. Conanthera, bell flowered.*  
*Crassula columnaris*, white. *Crassula, upright.*  
*Cymbidium aloi folium*, brown. *Boat orchis, aloe leaved.*  
*Cypripedium venustum*, green purple. *Ladies' slipper, hand-  
some*  
*Dianthus albens*, white. *Pink, Cape.*  
*Disa grandiflora*, scarlet, *r. Disa, large flowered.*  
*Dodecatheon*, purple. *American cowslip.*  
*Erodium incarnatum*, flesh colour. *Heron's bill, flesh colored.*  
*Eucomis bifolia*, light green. *Eucomis, two leaved.*  
*Euphorbia meloformis*. *Spurge, melon like.*  
 ———— *pilulifera*. ————, *Globular.*  
*Gentiana verticillata*, white. *Gentian, turned leaved.*  
*Geranium Wallichianum*, pink. *Geranium, Wallich's.*  
*Gloxinia speciosa*, purple. *Gloxiniu, many flowered.*  
*Iris chinensis*, pink and blue, *r. Iris, China.*  
*Linaria triornithophora*, purple. *Toad flax, three bird.*  
 ———— *Elatine*, yellow. ————, *Sharp pointed.*  
*Liparis bituberculata*, green. *Liparis, long leaved.*  
*Lobelia simplex*, blue. *Lobel's bell flower, simple stalked.*  
*Mentha Auricularia*, purple. *Mint, Indian.*

- Ophrys tenthredinifera*, yel, blue. *Ophrys*, sawfly.  
*Orchis spectabilis*, pink. *Orchis*, showy.  
*Pedicularis Canadensis*, yellow. *Louse wort*, *Canadian*.  
*Pelargonium* of various kinds. *Stork's bill*, commonly called  
*geranium*.  
*Primula sinensis*, pink, r. *Primrose*, *China*.  
*Ranunculus bullatus*, yellow, r. *Crow's foot*, *Portugal*.  
*Reseda dipétala*. *Mignonette*, *flax leaved*.  
*Satyrion carneum*, pink. *Satyr-orchis*, *great flowered*.  
*Saxifraga ligulata*, white. *Saxifage*, *slender*.  
 ——— *umbrosa*, pink. *London pride*.  
*Silene acaulis*, pink. *Catchfly*, *stemless*.  
 ——— *rubella*, do. ———, *Small red*.  
*Spiranthes pudica*, pink. *Screw flower*, *modest*.  
*Stapelia grandiflora*, purple r. *Stapelia*, *great flowered*.  
 ——— *ambigua*, brown, r. ———, *ambiguous*  
 ——— *hirsuta*, purple, r. ———, *hairy*.  
 ——— *bufonia*, yellow and brown, r. ———, *toad like*.  
 ——— *variegata*, brown and yellow, r. ———, *variegated*.  
 ——— *revoluta*, brown, r. ———, *rolled back*.  
 ——— *multiflora*, brown and yellow. ———, *many flowered*  
 ——— *stellaris*, purple and brown, r. ———, *starry*.  
*Thymus vulgaris*. *Thyme*, *common*.  
*Viola odorata*, blue. *Violet*, *sweet scented*.  
 ——— *primulifolia*, pale blue. ———, *primrose leaved*.  
 ——— *Nuttallii*, blue. ———, *Nuttall's*, *scentless*.  
 ——— *tricolor*, yellow and purple, r. ———, *Pansy* or *heart's ease*.

## FROM ONE FOOT TO TWO FEET HIGH.

- Andropogon Schœnanthus*. *Man's beard*, or *lemon grass*.  
*Aneilema sinicum*, purple. *Commeline*, *China*.  
*Anisomeles*, violet and pink. *Anisomeles*.  
*Antirrhinum molle*, white. *Snap dragon*, *soft leaved*.  
*Antennaria contorta*, white. *Antennaria*, *crooked*.  
*Anthericum latifolium*, white. *Anthericum*, *broad leaved*.  
*Aquilegia vulgaris*, purple. *Columbine*, *common*.

- Asphodelus ramosus*, white. *Asphodel*, branched.  
*Aster* of various kinds and colours. *Aster*.  
*Begonia odorata*, white. *Begonia*, sweet scented.  
*Brachystelma tuberosum*, purple. *Brachystelma*, tuberous  
*Canna indica*, red.  
 ———, spotted. } *Indian shot*.  
 ——— lutea, yellow. }  
*Cactus opuntia*, yellow. *Indian fig*.  
*Caladium odoratum*, white. *Caladium fragrant*.  
*Chenopodium murale*, green. *Goose foot*, nettle leaved.  
*Chrysanthemum* of various kinds. *Gold flower*.  
*Cheiranthus*, orange and yellow. *Wall flower*.  
*Cotyledon ovata*, red. *Navel-wort*, eggshaped.  
*Cypripedium insigne*, purple. *Lady's slipper*, noble.  
*Dianella nemerosa*, blue. *Diana's flower*, woody.  
*Dianthus barbatus*, pink and crimson. *Pink*, bearded.  
 ——— japonicus, pink. ———, *Japan*.  
 ——— chinensis, red. var : ———, *China*.  
 ——— caryophyllus, crimson. *Carnation*, clove.  
*Dracocephalum speciosum*, pink. *Dragon's head*, showy.  
 ——— variegatum, purple. ———, *variegated*.  
*Euphorbia repanda*. *Spurge*, flat leaved.  
*Geranium* of various kinds. *Geranium*, *Crane's bill*.  
*Hydeceum bisputlaedis*, greenish white.  
*Hyoscyamus*, niger, r. *Henbane*, black.  
 ——— orientalis, purple. ———, *Indian*.  
*Hypericum japonicum*, yellow. *St. John's wort*, *Japanese*.  
*Hypoestes involucrata*, white. *Hypoestes*, wrapped over.  
*Iberis semperflorens*, white. *Candytuft*, broad leaved.  
*Kæmpferia rotunda*, red and white. *Galungale*, round rooted.  
*Lavandula Spica*, lilac r. *Lavendar*.  
*Lupinus perennis*, blue and pink. *Lupine*, everlasting.  
*Marrubium africanum*, purple. *Horehound*, *African*.  
*Mathiola incana*, purple, white, red. *Stock*, *Gilly flower*.  
*Mesembryanthemum* of various kinds. *Fig marygold*.  
*Orehis plantagenia*, white. *Orchis*, plantain leaved

- Orchis corumelucefolia*, Do. *Orchis, glittering leaved.*  
*Origanum Dictamnus*, pink. *Marjoram, Dittany of Crete.*  
*Pæonia albiflora*, white and pink. *Pæony, light colored or*  
*edatle rooted.*  
*Pardanthus chinensis*, orange. *Leopard flower, China.*  
*Pentapetes phœnicia*, scarlet. *Pentapetes, scarlet flowered.*  
*Pelargonium*, of various kinds. *Stork's bill.*  
*Pentstemon campanulata*, purple. *Pentstemon, bell flowered.*  
 ——— glabra, dark purple. ———, *Nuttal's*  
*Pitcairnia bromeliæfolia*, scarlet. *Pitcairnia, pine-apple leaved.*  
 ——— latifolia, scarlet, r. ———, *broad leaved*  
*Potentilla nepalensis*, purple, r. *Cinquefoil, Nepal.*  
 ——— splendens, yellow. ———, *fine.*  
*Prostanthera lasianthos*, purple and white. *Prostanthera, vil-*  
*lous flowered.*  
*Roscoeæ purpurea*, purple. *Roscoeæ, purple.*  
*Salvia coccinea*, scarlet. *Sage, scarlet.*  
 ——— africana, violet r. ———, *African.*  
*Scabiosa atropurpurea*, brown. *Scabious, sweet.*  
 ——— grandiflora, white. ———, *great flowered.*  
*Silene indica*, purple. *Catchfly, Indian.*  
 ——— amœna, white and pink. ———, *Tartarian.*  
*Sphæranthus indicus*, blue. *Globe flower, Indian.*  
*Tacca*, purple. *Tacca.*  
*Teucrium*, various. *Germander.*  
*Thalictrum bracteatum*, blue. *Meadow rue, thin leaved.*  
*Tradescantia malabarica*, purple. *Spider wort, grass leaved.*  
*Tritoma media*, orange. *Tritoma, lesser,*  
*Troximon glaucum*, yellow. *Troximon, grey.*  
*Veronica pinnata*, blue. *Speed well, wing leaved.*  
*Wachendorfia paniculata*, yellow. *Wachendorfia, pannicled.*

## THREE FEET HIGH.

- Acanthus ilicifolius*. *Bear's breech, holly leaved.*  
*Aloe acinacifolia*, orange. *Aloe, sword-leaved.*  
 ——— acuminata, do. ———, *hedge-hog.*

<i>Alstræmeria pulchella</i> , scarlet, r.	<i>Alstræmeria</i> , the fair.
<i>Antirrhinum majus</i> , pink.	<i>Snap dragon</i> , greater.
<i>Asparagus racemosus</i> , white.	<i>Asparagus</i> , branching.
<i>Catananche cærulea</i> , blue.	<i>Catananche</i> , blue.
<i>Costus speciosus</i> , white.	<i>Costus</i> , shewy.
<i>Curcuma Zedoaria</i> , red.	<i>Turmeric</i> , broad leaved.
———— <i>elata</i> , crimson.	————, tall.
<i>Dracocephalum virginianum</i> , light blue.	<i>Dragon's head</i> , <i>Virginian</i>
<i>Euphorbia neriifolia</i> .	<i>Spurge</i> , <i>Oleander</i> leaved.
<i>Globularia longifolia</i> , white.	<i>Globulary</i> , long leaved.
<i>Kaulfussia amelloides</i> , light blue.	<i>Kaulfussia</i> , <i>Cape Aster</i> leaved.
<i>Lobelia splendens</i> , scarlet.	<i>Lobel's bell-flower</i> , showy.
<i>Polianthes tuberosa</i> , white.	<i>Tube rose</i> , common.
<i>Salvia aurea</i> , yellow r.	<i>Sage</i> , golden.
———— <i>splendens</i> , scarlet.	————, shewy.
<i>Thalictrum aquilegifolium</i> , purple.	<i>Meadow rue</i> , <i>Columbine</i> leaved.

## FOUR FEET HIGH.

<i>Aloe picta</i> , red.	<i>Aloe</i> , great soap.
———— <i>paniculata</i> , scarlet and yellow.	————, streaked.
<i>Artemesia</i> of various kinds.	<i>Wormwood</i> .
<i>Euphorbia lactea</i> .	<i>Spurge</i> , milky.

## ABOVE FOUR FEET HIGH.

<i>Aloe ferox</i> , yellow.	<i>Aloe</i> , great hedgehog.
<i>Alpinia Galanga</i> , white and yellow.	<i>Alpinia</i> , loose flowered.
———— <i>nutans</i> , pink.	————, nodding.
———— <i>malaccensis</i> , white.	————, petiolate.
<i>Althæa rosea</i> , red.	<i>Hollyhock</i> .
———— <i>pallida</i> , white.	<i>Marshmallow</i> , pale flowered.
———— <i>flexuosa</i> , pink.	————, <i>Seringapatam</i> .
<i>Bocconia cordata</i> , white.	<i>Bocconia</i> , heart leaved.

Cactus elatior, yellow.	<i>Prickly pear, great black spined.</i>
Dahlia, crimson. }	
——, purple.	
——, orange.	} <i>Dahlia.</i>
——, white.	
——, red.	
——, scarlet,	
Digitalis purpurea, purple.	<i>Foxglove, purple.</i>
Eupatorium asperum, lilac.	<i>Eupatorium, the unsightly.</i>
———— repandum, do.	———— spreading.
———— divergens, do.	———— turning.
———— cœlestinum, blue.	———— blue flowered.
Euphorbia antiquorum.	<i>Spurge, ancient.</i>
———— canariensis.	——, canary.
Hedychium coronarium, yellow.	<i>Garland flowers, sweet scented.</i>
———— angustifolium, red.	————, scarlet.
———— spicatum, yellow.	————, spiked.
———— flavum, do.	————, yellow.
Hibiscus palustris, pink.	<i>Hibiscus, marsh.</i>
Humea elegans, red.	<i>Humea, handsome.</i>
Lavatera arborea, purple	<i>Tree mallow.</i>
———— thuringiaca, blue.	<i>Lavatera, large flowered</i>
Phrynum capitatum, white.	<i>Phrynum, headed.</i>
Rheum palmatum r.	<i>Rhubarb.</i>
Strelitzia reginæ yellow.	<i>Strelitzia, canna leaved.</i>

## BIENNIAL.

## UNDER ONE FOOT HIGH.

<i>Anchusa capensis</i> , blue.	<i>Bugloss, Cape.</i>
<i>Arctotis argentea</i> , orange.	<i>Arctotis, silver leaved.</i>
<i>Aster tenellus</i> , bluish.	<i>Aster, tender.</i>
<i>Catananche lutea</i> , yellow.	<i>Catananche, yellow.</i>
<i>Erigeron acre</i> , blue.	<i>Erigeron, blue.</i>
<i>Erodium bipinnatum</i> , purple.	<i>Heron's bill, Numidian.</i>



- Gratiola veronicifolia*, blue. *Hedge-hyssop, veronica leaved.*  
*Lobelia simplex*, blue. *Lobel's bell flower, simple stalked.*  
*Mesembryanthemum Aitonii*, pink. *Fig marygold, Aiton's.*  
*Oenothera mutabilis*, white. *Evening primrose.*  
*Pelargonium althæoides*, white. *Stork's bill, althea leaved.*  
 ——— *caucalisfolium*, pink. ———, *caucalis-leaved*  
*Salvia pinnata*, purple. *Sage, winged.*  
*Valeriana elongata*, yellow. *Valerian, elongated.*

FROM ONE TO TWO FEET HIGH.

- |                                     |  |
|-------------------------------------|--|
| Anarrhinum bellidifolium, blue.     | <i>Anarrhinum, daisy leaved.</i>               |
| Anagallis latifolia, purple.        | <i>Pimpernel, broad leaved.</i>                |
| ———— linifolia, blue.               | ————, <i>flax leaved.</i>                      |
| Anchusa paniculata, blue.           | <i>Bugloss, panicked.</i>                      |
| Arctotis grandiflora, yellow.       | <i>Arctotis, large flowered.</i>               |
| Berteroa incana, white.             | <i>Berteroa, hoary.</i>                        |
| Browallia demissa blue.             | <i>Browallia, spreading.</i>                   |
| ———— elata, white.                  | ————, <i>upright.</i>                          |
| Campanula gracilis, blue.           | <i>Bell-flower, slender.</i>                   |
| ———— lancifolia, white.             | ————, <i>spear-leaved.</i>                     |
| Celosia comosa, pink.               | <i>Cockscomb, tufted.</i>                      |
| Conyza hirsuta, yellow and purple.  | <i>Flea bane, shaggy.</i>                      |
| Cynoglossum cheirifolium, blue.     | <i>Honud's tongue, silvery leaved.</i>         |
| Hallia flaccida, purple.            | <i>Hallia, long leaved.</i>                    |
| Heliotropium parviflorum, white.    | <i>Heliotrope or Turnsole, small flowered.</i> |
| ———— Peruvianum, lilac.             | ————, <i>Peruvian</i>                          |
| Heliophila coronopifolia, violet.   | <i>Heliophila, buck's horn leaved.</i>         |
| Hesperis tristis, purple.           | <i>Rocket, night smelling.</i>                 |
| ———— laciniata, purple.             | ————, <i>jagged.</i>                           |
| Hibiscus Trionum, yellow and brown. | } <i>Bladder ketmia.</i>                       |
| ————, rose colour.                  |  |
| Iberis linifolia, purple.           | <i>Candytuft, flax leaved.</i>                 |
| Lotus glaucus, yellow.              | <i>Bird's foot trefoil, seagreen.</i>          |
| Lupinus Mexicanus, blue.            | <i>Lupine, Mexican.</i>                        |

<i>Mathiola sinwata</i> , violet.	<i>Stock</i> , great sea.
——— odoratissima, pale.	———, <i>Persian</i> .
<i>Ocymum tenuiflorum</i> , purple.	———, <i>Basil</i> , slender spike.
<i>Oenothera rosea</i> , pink.	<i>Oenothera</i> , rose colored
——— purpurea, purple.	———, <i>purple</i> .
<i>Osbeckia Zeylanica</i> , yellow.	<i>Osbeckia</i> , <i>Ceylonese</i> .
<i>Primula sinensis</i> , pink.	<i>Primrose</i> , <i>Chinese</i> .
<i>Scabiosa isetensis</i> , white.	<i>Scabious</i> , <i>Siberian</i> .
<i>Tephrosia piscatoria</i> , purple.	<i>Ash plant</i> , woolly.
<i>Trifolium bracteatum</i> , purple.	<i>Trefoil</i> , large leaved.

## FROM TWO TO THREE FEET.

<i>Agrostemma coronaria</i> , red.	<i>Rose campion</i> , common
<i>Aster <sup>a</sup>dumosus</i> , white.	<i>Aster</i> , bushy.
——— <i>elegans</i> , lilac.	———, <i>handsome</i> .
<i>Celsia lanceolata</i> , yellow.	<i>Celsia</i> , spear leaved.
<i>Cineraria viscosa</i> , yellow.	<i>Cinerary</i> , clammy.
<i>Coreopsis chrysantha</i> , yellow.	<i>Coreopsis</i> , angelica leaved.
——— lanceolata, yellow.	———, spear leaved.
<i>Crotalaria tetragona</i> , yellow.	<i>Crotalaria</i> , square stalked.
<i>Cynoglossum officinale</i> , purple.	<i>Hound's tongue</i> , common
——— <i>sylvaticum</i> , blue.	———, green leaved.
<i>Echium strictum</i> , blue.	<i>Viper's bugloss</i> , upright
<i>Hedysarum gyrans</i> , purple.	<i>Moving plant</i> .
<i>Justicia speciosa</i> , lilac.	<i>Justicia</i> , beautiful.
<i>Lotus jacobæus</i> , brown.	<i>Bird's foot trefoil</i> , dark flowered.
<i>Mirabilis jalapa</i> , red and white.	<i>Marvel of Peru</i> , common.
<i>Philydrum</i> , yellow.	<i>Philydrum</i> , woolly.
<i>Podospermum laciniatum</i> , yellow.	<i>Podospermum</i> , cut leaved.
<i>Rafnia triflora</i> , purple.	<i>Rafnia</i> , three flowered.
<i>Sida Zeylanica</i> , yellow.	<i>Sida</i> , <i>Ceylonese</i> .

## FROM THREE TO FOUR FEET.

<i>Dipsacus inermis</i> , white	<i>Teasel</i> , unarmed.
<i>Hibiscus pruriens</i> , yellow.	<i>Hibiscus</i> , stinging.
<i>Indigofera hirsuta</i> , pink.	<i>Indigo</i> , hoary.

<i>Ceanothus biennis</i> , yellow.	<i>Ceanothus biennis</i> .
———— <i>grandiflora</i> , yellow	————, <i>great flowered</i> .

## ABOVE FOUR FEET.

<i>Angelica sylvestris</i> , pink.	<i>Angelica</i> , <i>wild</i> .
<i>Celsia cretica</i> , yellow.	<i>Celsia</i> , <i>great flowered</i>
<i>Crotalaria laburnifolia</i> , yellow.	<i>Crotalaria</i> , <i>laburnum leaved</i> .
<i>Deeringia celosioides</i> , white.	<i>Deeringia</i> , <i>berry bearing</i> .
<i>Hedysarum coronarium</i> scarlet.	<i>French honey suckle</i>
<i>Hibiscus cannabinus</i> , yellow.	<i>Hibiscus</i> , <i>hemp leaved</i> .
<i>Lavatera arborea</i> , purple.	<i>Tree mallow</i> .

## ANNUAL.

## UNDER ONE FOOT HIGH.

<i>Antirrhinum orontium</i> , pink.	<i>Snap dragon</i> , <i>lesser</i> .
<i>Bupleurum odontites</i> , green.	<i>Hare's ear</i> , <i>narrow leaved</i> .
<i>Cuphea circaeoides</i> , purple.	<i>Cuphea</i> , <i>circe like</i> .
<i>Dianthus prolifer</i> , pink.	<i>Pink</i> , <i>prolific</i> .
———— <i>diminutus</i> , pink. ————,	<i>diminutive</i> .
<i>Dracocephalum thymi florum</i> , purple.	<i>Dragon's head</i> , <i>thyme flowered</i> .
<i>Erodium romanum</i> , purple.	<i>Heron's bill</i> , <i>Roman</i> .
<i>Evolvulus nummularius</i> , blue.	<i>Money wort</i> .
<i>Heliotropium indicum</i> , blue.	<i>Turn sole</i> , <i>Indian</i> .
<i>Iberis amara</i> , white.	<i>Candytuft</i> , <i>bitter</i>
<i>Lupinus pulchellus</i> , blue.	<i>Lupine</i> , <i>pretty</i> .
———— <i>ornatus</i> pink.	————, <i>handsome</i> .
<i>Malcomia Africana</i> , purple.	<i>Malcomia</i> , <i>African</i> .
<i>Mathiola parviflora</i> , purple.	<i>Stock</i> , <i>small flowered</i>
<i>Mesembryanthemum roseum</i> , pink.	<i>Fig marygold</i> , <i>rose colored</i> .
———— <i>lanceolatum</i> , white. ————,	<i>spear leaved</i> .
———— <i>calendulaceum</i> , yellow.	<i>Pot marygold</i> .
———— <i>Helianthoides</i> yellow.	<i>Sun flower</i> <i>formed marygold</i> .

Portulaca Meridiana, yellow.	<i>Purslane, noonday.</i>
Ricotia ægyptiaca, light purple.	<i>Ricotia, Egyptian.</i>
Silene rubella, pink	<i>Catchfly, small red.</i>
—, lusitania, pink.	—, <i>Portugal.</i>
Veronica præcox, blue.	<i>Speedwell, early.</i>
Viola tricolor, yellow and purple.	<i>Pansy, or heart's ease.</i>
Ziziphora hispanica, red.	<i>Ziziphora, Spanish.</i>

## FROM ONE TO TWO FEET HIGH.

Adonis flava, yellow.	<i>Adonis, yellow.</i>
Asphodelus clavatus, white.	<i>Aspadel, club seeded.</i>
Calendula sicula, yellow.	<i>Marygold, Sicilian.</i>
— stellata, orange.	— <i>starry.</i>
Celosia cristata, red.	<i>Cockscomb, common.</i>
Centaurea, purple, blue, pink, red, and white.	<i>Centaury.</i>
Chrysanthemum, yellow and white.	<i>Chrysanthemum.</i>
Cleome chelidoni, red.	<i>Cleome, celandine flowered.</i>
— viscosa, pink.	—, <i>viscid.</i>
— pentaphylla, white.	—, <i>five leaved.</i>
— rosea, pink.	—, <i>rose colored.</i>
Coreopsis tinctoria, yellow.	<i>Coreopsis, dyer's.</i>
Dracocephalum Moldavica, blue.	<i>Dragon's head, Moldavian.</i>
Echium plantagineum.	<i>Viper's bugloss, plantain leaved.</i>
Elsholtzia cristata, pink.	<i>Elsholtzia, crested.</i>
Evolvulus linifolius, blue.	<i>Evolvulus, flax leaved.</i>
Gomphrena globosa, purple and white	<i>Globe amaranth, annual.</i>
Glaucium luteum, yellow.	<i>Horn poppy, yellow.</i>
Heliotropium Europeum, white.	<i>Turnsole, European.</i>
Iberis umbellata, purple.	<i>Candytuft, round headed.</i>
Inula indica, yellow.	<i>Inula, Indian.</i>
Lopezia coronata, red.	<i>Lopezia, coronet flowered.</i>
Lavatera cretica, light blue.	<i>Lavatera, Cretan.</i>
— trimestris, pink.	—, <i>common</i>
Linaria latifolia, yellow.	<i>Toad flax, broad leaved.</i>
— simplex, blue.	—, <i>upright.</i>

Linum rigidum, purple and yellow.	<i>Flax, stiff leaved.</i>
Lobelia kalmii, blue.	<i>Lobel's bell flower, Kalm's.</i>
Mathiola annua, red.	<i>Stock, annual.</i>
———— græca, white.	————, <i>Grecian</i>
Nemesia bicornis, purple.	<i>Nemesia, horned.</i>
Oenothera purpurea, purple.	<i>Oenothera, purple.</i>
———— stricta, yellow.	————, <i>upright.</i>
Omphalodes linifolia, white.	<i>Venus' navel-wort, common.</i>
Papaver of various colours single and double.	<i>Poppy.</i>
Reseda odorata.	<i>Mignonette, sweet scented.</i>
Salvia viridis, pink.	<i>Sage, green.</i>
Sesuvium repens, red and white.	<i>Sesuvium, creeping.</i>
Scabiosa stellata, blue.	<i>Scabious, starry.</i>
Silene elegans, white.	<i>Catchfly, elegant.</i>
———— armeria, pink.	————, <i>Lobel's.</i>
Siegesbeckia orientalis, yellow.	<i>Siegesbeckia, Indian.</i>
Tagetes patula, orange.	<i>French marygold.</i>
Tolpis barbata, yellow and purple.	<i>Tolpis, purple eyed.</i>

## FROM TWO TO THREE FEET HIGH.

Adonis autumnalis, crimson, r.	<i>Pheasant's eye.</i>
Amarantus caudatus, crimson.	<i>Love lies bleeding.</i>
———— hypochondriacis, do.	<i>Prince's feather.</i>
———— cruentus — do.	<i>Amaranth, various leaved.</i>
Aster chinensis, purple.	<i>China aster.</i>
Calceolaria pinnata, yellow.	<i>Slipper wort, wing leaved.</i>
Celosia monsoniæ, white.	<i>Cockscomb, Monson's.</i>
Centaurea moschata, lilac.	<i>Sweet sultan.</i>
Delphinium ambiguum, blue.	<i>Larkspur, doubtful</i>
———— ajacis, pink.	<i>Rocket.</i>
———— Neapolitum, variegated.	<i>Larkspur, Neapolitan.</i>
Impatiens balsamina, red, white, and lilac.	<i>Balsam, garden.</i>
———— nolitangere, yellow.	<i>Touch me not.</i>
Hibiscus radiatus, yellow.	<i>Hibiscus, rayed.</i>
Lantana annua, pink.	<i>Lantana, annual.</i>

Lupinus albus, white.	<i>Lupine, white.</i>
———— varius, blue.	————, <i>various.</i>
———— pilosus, pink.	————, <i>hairy.</i>
———— luteus, yellow.	————, <i>yellow.</i>
Malva verticilla, purple.	<i>Mallow, whirl flowered.</i>
Melilotus cærulea, blue.	<i>Melilot, blue.</i>
———— indica, white	————, <i>Indian.</i>
Stachytarpheta indica, white.	<i>Bastard vervain.</i>
Scabiosa grandiflora, white.	<i>Scabious, great flowered.</i>
Tagetes erecta, yellow.	<i>African marygold.</i>
Xeranthemum annuum, purple.	<i>Xeranthemum, annual.</i>
Zinnia multiflora, red.	<i>Zinnia, red flowered.</i>
———— elegans, purple.	————, <i>purple flowered.</i>
———— hybrida, scarlet.	————, <i>hybrid.</i>

## FROM THREE TO FOUR FEET HIGH.

Aconitum, blue.	<i>Monk's hood.</i>
Celosia coccinea, purple.	<i>Cockscomb, crimson.</i>
Helianthus indicus, yellow.	<i>Sunflower, Indian.</i>
Justicia bicolyculata, lilac.	<i>Justicia Malabar.</i>

## ABOVE FOUR FEET HIGH.

Althæa hirsuta, purple.	<i>Althæa, hairy.</i>
Amarantus speciosus, crimson.	<i>Amaranth, beautiful.</i>
———— sanguineus do.	————, <i>blood red.</i>
Helianthus annuus, yellow.	<i>Sunflower, large annual.</i>

**Bulbous Plants.**

	<i>Height.</i>
Agapanthus umbellatus, blue, r. <i>African lily, large flowered.</i>	3
Amaryllis formosissima, dark red, r. <i>Amaryllis, or Jacobæa</i>	
	<i>lily.</i> 0½
———— insignis, pink, r.	————, <i>noble.</i> 3

Amaryllis, zeylanica, purple, r.	Amaryllis, Ceylonese.	3
———— belladonna, pink, r.	————, fair lady's.	2
———— cyrtanthoides, r., crimson,	————, cyrtanthus	
	like.	1
———— crocata, orange, ..	————, saffron flowered.	1
———— rutila, scarlet, r.	————, fiery.	1
———— fulgida, pale red,	————, striped.	0 $\frac{3}{4}$
———— latifolia, white,	————, broad leaved.	3
Antholyza æthiopica, orange	Antholyza, æthiopian.	3
Brunsvigia multiflora, red.	Brunsvigia, many flowered.	1
Calostemma luteum, yellow.	Calostemma, yellow.	1
Chrysiphiala flava, orange.	Golden cup, yellow.	1
Chlorophytum orchidastum, white, r.	Chlorophytum, orchis	
like.		2
Colchicum autumnale, purple, r.	Meadow saffron, common.	0 $\frac{1}{4}$
Crinum pedunculatum, white,	Crinum, long crooked.	3
———— cruentum, red, ..	————, red flowered.	4
———— commelini, white, r.	————, commelin's	2
———— defixum, white.	————, marsh.	2
———— declinatum, white	————, sloping.	2
———— careyanum, white	————, Carey's.	2
Crocus, various coloured, r.	Crocus	0 $\frac{1}{4}$
Cyanella capensis, blue, r.	Cyanella, Cape.	1
Drimia altissima, whitish green	r. Drimia, tall.	1 $\frac{1}{2}$
Fritillaria imperialis, red, r.	Crown imperial,	4
———— lutea, yellow	Fritillary, yellow.	1
Galanthus, nivalis, r.	Snow drop.	0 $\frac{1}{2}$
Geissorhiza setacea, yellow, r.	Tile root, bristle leaved.	1
Gladiolus hastatus, pink.	Cornflag, spade spotted.	1
———— trichonemifolius, yellow, r.	————, violet scented.	1 $\frac{1}{2}$
———— blandas, pink, r.	————, blush.	1 $\frac{1}{4}$
———— campanulatus, pink, r.	————, bell flowered.	1
———— floribundus, yellow.	————, large flowered.	1
Gloriosa superba, orange.	Gloriosa, superb.	6
Hæmanthus coccinea, red	r. Blood flower, scarlet.	1

Hæmanthus, puniceus, scarlet, <i>r.</i> <i>Blood flower, wave leaved.</i>	1
————— tigrinus, pink —————, <i>tiger spotted.</i>	1
Hyacinthus, blue, and pink <i>rr.</i> <i>Hyacinth.</i>	0 $\frac{3}{4}$
Iris lusitanica, blue <i>Iris, Portugal.</i>	2
IXIA linearis, white <i>r.</i> <i>IXIA, slender.</i>	0 $\frac{1}{2}$
—— capillaris, violet <i>r.</i> ———, <i>capillary.</i>	1 $\frac{1}{2}$
—— fucata, pink ———, <i>painted.</i>	0 $\frac{1}{2}$
—— conica, orange ———, <i>orange colored.</i>	1 $\frac{1}{2}$
—— curta, blue <i>r.</i> ———, <i>short.</i>	0 $\frac{1}{2}$
—— columellaris, scarlet ———, <i>variegated.</i>	0
—— crateroides, crimson <i>r.</i> ———, <i>crimson.</i>	0 $\frac{1}{2}$
—— retusa, yellow ———, <i>sweet scented.</i>	1
Lachenalia quadricolor, scarlet and yellow <i>Lachenalia,</i>	
————— <i>four colored</i>	1
————— luteola Do. ———, <i>yellow.</i>	1
Lilium candidum, white <i>r.</i> <i>Lily, white.</i>	3
—— japonicum, white ———, <i>Japan.</i>	2
—— bulbiferum, orange ———, <i>bulbous.</i>	3
—— canadensis, orange ———, <i>Canadian.</i>	4
—— spectabile, orange <i>r.</i> ———, <i>showy.</i>	3
—— tigrinum, orange ———, <i>tiger spotted.</i>	4
Morœa lurida, crimson <i>Morœa, pale.</i>	0 $\frac{1}{2}$
—— longifolia, yellow <i>r.</i> ———, <i>long leaved</i>	0 $\frac{1}{2}$
Massonia scabra white <i>Massonia, shagreen leaved.</i>	0 $\frac{1}{4}$
Narcissus, poeticus, white <i>Narcissus of the poets.</i>	1
——, nutans, yellow ———, <i>nodding.</i>	1
——, tazetta, white ———, <i>polyanthus.</i>	1
——, triandrus, white <i>r.</i> ———, <i>rush leaved.</i>	0 $\frac{3}{4}$
——, biflorus, white, <i>r.</i> ———, <i>two flowered.</i>	1
——, gracilis, yellow ———, <i>slender.</i>	1 $\frac{1}{2}$
Nerine aurea, yellow <i>Nerine, golden.</i>	1
Ornithogalum virens, green <i>r.</i> <i>Star of Bethlehem, greenish.</i>	1 $\frac{1}{2}$
—— elatum white <i>r.</i> ———, <i>tall.</i>	3
—— lacteum, white <i>r.</i> ———, <i>milky.</i>	1
Oxalis corniculata, yellow. <i>Oxalis, prostrate.</i>	0 $\frac{1}{4}$



Oxalis, rosea, pink r.	<i>Oxalis, pink.</i>	0½
Pancratium zeylanicum, white	<i>Pancratium, Ceylonese.</i>	1
———— amancaes, yellow r.	————, <i>narcissus-flowered.</i>	1½
———— ovatum, white	————, <i>oval leaved.</i>	1
———— biflorum, white	————, <i>two flowered.</i>	1
Sparaxis grandiflora, purple r.	<i>Sparaxis, great flowered.</i>	0½
———— tricolor, orange r.	————, <i>three colored.</i>	1
Scilla Indica pink	<i>Squill, Indian.</i>	1
———— lusitanica blue v.	————, <i>Portugal.</i>	0½
Tritonia crocata, orange r.	<i>Tritonia, crocus flowered.</i>	0½
Zuccagnia viridis, green	<i>Zuccagnia, green.</i>	0¾

### Aquatic Plants.

Aponogeton monastachyon, pink.	<i>Aponogeton, simple spiked.</i>
Euryale ferox, red.	<i>Euryale, prickly.</i>
Herpestis monniera, blue.	<i>Herpestis, thyme leaved.</i>
Hottonia, blue and white.	<i>Water violet.</i>
Littorella, white.	<i>Shoreweed.</i>
Nelumbium speciosum, pink.	<i>Sacred bean, Indian.</i>
———— luteum, yellow.	————, <i>yellow.</i>
Nymphæa lotus, pink.	<i>Ægyptian lotus.</i>
rubra, red.	<i>Water lily, red flowered.</i>
rosea, pink.	————, <i>pink.</i>
———— versicolor, pink.	————, <i>changing colors.</i>
———— stellata, blue.	————, <i>star flowered.</i>
———— cærulea, blue.	————, <i>blue.</i>
———— esculenta, white.	————, <i>eatable.</i>
Pontederia, dilatata, blue.	<i>Pontederia, spreading.</i>
Sagittaria rigida, white.	<i>Arrow head, brittle leaved.</i>

## Creeping and Trailing Plants.

### PERENNIAL AND BIENNIAL.

		<i>Height.</i>
Amellus lychnitis, violet.	<i>Amellus, trailing.</i>	$\frac{1}{2}$
Commelina Africana yellow.	<i>Commelina, African.</i>	1
———— bengalensis, blue.	————, <i>Bengal.</i>	3
Convolvulus reptans, purple.	<i>Bind weed, creeping.</i>	1
Gouania tiliæfolia, green.	<i>Gouania, lime tree leaved.</i>	10
Heliotropium corymbosum, lilac.	<i>Turnsole, large flowered.</i>	4
Justicia procumbens, pink.	<i>Justicia, laying down.</i>	$\frac{1}{2}$
Potentilla reptans, yellow.	<i>Cinquefoil, creeping.</i>	$\frac{3}{4}$
Rubus moluccanus, red.	<i>Bramble, Molucca.</i>	3
Veronica prostrata, blue.	<i>Speedwell, trailing.</i>	1
Viola odorata, purple.	<i>Violet, sweet scented.</i>	$\frac{1}{2}$
—, cærulea blue.	————, <i>wild blue.</i>	$\frac{1}{2}$

### ANNUAL.

Anagallis arvensis, scarlet.	<i>Pimpernel, common.</i>	$\frac{1}{2}$
Campanula speculum, purple.	} <i>Venus' looking glass.</i>	11
———— white.		
———— pentagonia, blue.	<i>Bell flower, five angled.</i>	1
Coldenia procumbens, white.	<i>Coldenia, trailing.</i>	2
Convolvulus siculus, blue.	<i>Bind weed, small flowered.</i>	1
———— hirtus, blue.	————, <i>hairy stalked.</i>	3
———— tricolor, scarlet	————, <i>three colored.</i>	3
Heliotropium supinum, white.	<i>Turnsole, lowly.</i>	$\frac{1}{2}$
Ipomæa, maritima, purple.	<i>Ipomæa, thick leaved.</i>	10
Linaria cirrhoser, blue.	<i>Toad flux. tendrilled.</i>	$\frac{1}{4}$
Nasturtium minor, yellow.	<i>Nasturtium, lesser.</i>	6
Vinca major, blue.	<i>Periwinkle, larger.</i>	1
— alba, white.	————, <i>white.</i>	1

## Climbing and Twining Plants.

### PERENNIAL AND BIENNIAL.

	<i>Height.</i>
<i>Abrus precatorius</i> , pale pink. <i>Wild liquorice, Jamaica,</i>	12
<i>Acacia pennata</i> , yellow. <i>Accacia, fine leaved,</i>	1
<i>Bauhinia corymbosa</i> , white and pink. <i>Mountain ebony,</i>	
<i>many flowered.</i>	20
———— <i>scandens</i> , white and yellow. ———, <i>climbing,</i>	30
———— <i>variegata</i> , scarlet. ———, <i>variegated,</i>	20
———— <i>parviflora</i> white. ———, <i>small flowered,</i>	20
<i>Bignonia capriolata</i> , scarlet. <i>Trumpet flower, four leaved,</i>	15
———— <i>grandiflora</i> , orange r. ———, <i>great flowered.</i>	30
<i>Caprifolium italicum</i> , yellow. <i>Honeysuckle, Italian,</i>	10
———— <i>serotinum</i> yellow and red. ———, <i>late flow-</i>	
<i>ering.</i>	20
———— <i>japonicum</i> orange. ———, <i>japanese,</i>	15
———— <i>sempivirens</i> , scarlet. ———, <i>trumpet,</i>	15
<i>Clematis austriaca</i> , blue r. <i>Virgin's bower, alpine.</i>	12
———— <i>fragrans</i> white, ———, <i>fragrant.</i>	20
———— <i>chinensis</i> white. ———, <i>Chinese.</i>	12
———— <i>gracilis</i> , white. ———, <i>slender.</i>	20
<i>Clitoria ternatea</i> , blue. <i>Clitoria, wing leaved.</i>	5
———— <i>plumiera</i> , white ———, <i>plumier's.</i>	6
<i>Cocculus</i> , plunkenetü, green. <i>Cocculus, useful.</i>	10
<i>Convolvulus erubescens</i> , pink. <i>Bindweed, blushing.</i>	6
———— <i>japonicus</i> , purple. ———, <i>Japanese.</i>	6
<i>Cylista scariosa</i> , yellow. <i>Cylista, Coromandel.</i>	4
<i>Dalbergia</i> , rubiginosa, white. <i>Dalbergia, climbing.</i>	10
<i>Dolichos purpureus</i> , purple. <i>Dolichos, purple.</i>	12
———— <i>malescinus</i> do. ———, <i>Assam.</i>	12
<i>Echites caryophyllata</i> , yellow. <i>Echites, clove leaved.</i>	6
———— <i>umbellata</i> , white. ———, <i>tufted.</i>	15
———— <i>grandiflora</i> , pink. ———, <i>great flowered.</i>	8

Gonolobus hirsutus, purple.	<i>Gonolobus, hairy.</i>	6
Glycine sinensis, blue.	<i>Glycene, Chinese.</i>	15
Hoya carnosa, pink.	<i>Hoya, fleshy leaved.</i>	10
—, lanceolata, white.	—, <i>spear leaved.</i>	2
Ipomæa pendula, pink.	<i>Ipomæa, hanging.</i>	10
— paniculata, pink,	—, <i>panicled.</i>	20
— jalapa, lilac, r.	—, <i>jalap.</i>	20
— speciosa, purple.	—, <i>beautiful.</i>	8
— grandiflora, white.	—, <i>large flowered.</i>	8
Jasminum azoricum, yellow.	<i>Azorian. Jasmine.</i>	5
— revolutum, do.	—, <i>curled flowered.</i>	12
— officinale, white.	—, <i>common.</i>	15
— grandiflorum, do.	—, <i>large flowered.</i>	15
— trinerve, do.	—, <i>three nerved.</i>	20
— paniculatum, do.	—, <i>panicled.</i>	5
Kennedia coccinea, scarlet.	<i>Kennedia, many flowered.</i>	10
Lathyrus sylvestris, purple.	<i>Everlasting pea.</i>	3
— latifolius, pink.	—, <i>broad leaved.</i>	6
Lettomia cuneata, crimson.	<i>Lettsomia, wedge shaped.</i>	10
Mimosa sensitiva, pink.	<i>Sensitive plant.</i>	5
Nasturtium, orange.	<i>Nasturtium.</i>	2
Passiflora racemosa, scarlet.	<i>Passion flower, clustering.</i>	40
— alata, green and blue.	—, <i>winged stalked.</i>	20
— laurifolia, green and purple.	—, <i>laurel leaved.</i>	20
— fœtida, white.	—, <i>fetid.</i>	10
— edulis, white.	—, <i>eatable.</i>	30
— cerulea, white and blue.	—, <i>blue.</i>	30
Pergularia odorotissima, green.	<i>Trellis flower, large.</i>	15
Quisqualis indica, orange and red.	<i>Quisqualis, Indian.</i>	20
Smilax zeylanica, green.	<i>Smilax, Ceylonese.</i>	10
Thunbergia grandiflora, blue,	<i>Thunbergia, large flowered.</i>	30
— Hawtonia, white. }	—, <i>Hawton's.</i>	6
— —, lilac... }		
— fragrans, white.	—, <i>sweet scented.</i>	

ANNUAL.		Height.
Convolvulus major, purple.	<i>Bind weed, greater.</i>	6
———— ciliatus, pink.	————, <i>hairy.</i>	6
———— pentapetaloides, blue.	————, <i>Majorca.</i>	2
———— chinensis, yellow.	————, <i>Chinese.</i>	6
Coreopsis reptans, yellow	<i>Coreopsis, trailing.</i>	6
Dolichos sinensis, purple.	<i>Dolichos, Chinese.</i>	6
Ipomæa quamoclit, red.	<i>Ipomea, wing leaved.</i>	6
———— coccinea, scarlet	————, <i>scarlet.</i>	6
———— cœrulea, blue.	————, <i>blue.</i>	9
———— striata, white and blue.	————, <i>channeled.</i>	6
———— campanulata, white and purple.	————, <i>bell shaped.</i>	8
———— purpurea, purple.	————, <i>purple.</i>	10
————, denticulata, yellow.	————, <i>notched.</i>	6
———— tridentata, yellow.	————, <i>trifid.</i>	10
Lathyrus odoratus, white and red.	} <i>Sweet pea.</i>	4
————, purple and red.		
———— tingitanus, purple.	<i>Tangier pea,</i>	4
———— nissolia, crimson.	<i>Lathyrus, crimson.</i>	2
Murrandia anterrhinifolia, purple.	<i>Murrandia, arrow leaved.</i>	3
Vicia bengalensis, purple.	<i>Vetch, Bengal.</i>	3

## Ornamental Trees.

Abroma augusta, purple.	<i>Abroma, smooth stalked.</i>	10
Acacia odoratissima, white.	<i>Accacia, sweet scented.</i>	30
———— pink.	————, <i>red.</i>	30
———— catechu, yellow.	————, <i>medicinal.</i>	40
———— arabica, white.	<i>Gum Arabic tree.</i>	20
Anagyris indica, yellow.	<i>Bean-trefoil, Nepal.</i>	8
Ardisia paniculata, red.	<i>Ardisia, panicked.</i>	12
Bactris minor.	<i>Bactris, lesser.</i>	12
———— major.	————, <i>greater.</i>	25

<i>Broussonetia papyrifera</i> r. <i>Paper mulberry.</i>	12
<i>Butea frondosa</i> , scarlet. <i>Butea</i> , downy.	30
<i>Canella alba</i> , white. <i>Canella</i> , laurel leaved	90
<i>Calophyllum inophyllum</i> , white. <i>Calophyllum</i> , sweet scented.	40
<i>Caryophyllus aromaticus</i> , white. <i>Clove tree</i>	20
<i>Casuarina muricata</i> . <i>Cassowary fir</i> , prickly.	30
<i>Carissa carandas</i> , white. <i>Carrissa</i> , jasmine flowered.	15
<i>Caragana</i> , orange. <i>Siberian peatree.</i>	15
<i>Cordia myxa</i> , white. <i>Cordia</i> , smooth leaved.	30
<i>Cedrela toona</i> , pink. <i>Toon tree.</i>	50
<i>Cupressus sempervirens</i> . <i>Cypress</i> , evergreen.	20
———— <i>lusitanica</i> . ———, <i>Portugal</i>	12
———— <i>australis</i> . ———, <i>Australian.</i>	10
<i>Cytisus laburnum</i> , yellow. r. <i>Laburnum.</i>	15
<i>Clusia rosea</i> , red. r. <i>Balsam tree</i> , rose colored.	30
<i>Erythrina indica</i> , scarlet. <i>Coral tree</i> , <i>Indian.</i>	20
<i>Eugenia jambos</i> , green. <i>Eugenia</i> , narrow leaved.	25
<i>Ficus elastica</i> . <i>Indian rubber tree.</i>	20
———— <i>macrophylla</i> . <i>Fig</i> , wide spreading.	16
<i>Glycosmis arborea</i> , white. <i>Glycosmis</i> , tree.	20
<i>Grewia hirsuta</i> , purple. <i>Grewia</i> , soft leaved.	10
<i>Gmelina asiatica</i> , yellow. <i>Gmelina</i> , Asiatic.	10
———— <i>parviflora</i> , orange. ———, small flowered.	10
<i>Guettarda speciosa</i> , scarlet. <i>Guettarda</i> , great flowered.	30
<i>Heritiera littoralis</i> . <i>Looking glass plant</i> , laurel leaved.	20
<i>Hibiscus sinensis</i> , purple. <i>Hibiscus</i> , Chinese.	10
<i>Hymeodyction thyrsoflora</i> . <i>Hymeodyction.</i>	20
<i>Laurus cinnamomum</i> , greenish white. <i>Cinnamon tree.</i>	20
———— <i>cassia</i> , white. <i>Cassia.</i>	50
———— <i>camphora</i> , greenish white. <i>Camphor tree.</i>	20
———— <i>nobilis</i> , yellow white. <i>Sweet bay tree.</i>	15
<i>Malpighia glabra</i> , red. <i>Malpighia</i> , smooth leaved.	16
<i>Magnolia grandiflora</i> , white. <i>Magnolia</i> , great flowered.	20
———— <i>glauc</i> a, white. ———, deciduous.	20
———— <i>macrophylla</i> , white. ———, large leaved.	30

Nauclea orientalis, yellow.	<i>Nauclea orient.</i>	30
Ornus floribunda, white.	<i>Flowering ash.</i>	30
Plumieria acuminata, red yellow.	<i>Plumieria, prickly.</i>	20
Pimenta vulgaris, white.	<i>Pimento tree.</i>	30
Pinus excelsa.	<i>Pine, Nepal.</i>	100
—— longifolia.	——, <i>long leaved.</i>	40
Pterocarpus marsupium, white.	<i>Pterocarpus, purse bearing.</i>	40
Rhododendron arboreum, purple.	<i>Rhododendron, woody.</i>	20
——, album, white. r.	——, <i>white.</i>	20
Robinia inermis, purple.	<i>Robinia, smooth leaved.</i>	40
—— viscosa, pink.	——, <i>clammy.</i>	30
—— purpurea, purple.	——, <i>purple.</i>	15
—— violacea, violet.	——, <i>violet colored.</i>	12
Salisburia adiantifolia, r.	<i>Salisburia, maiden hair leaved.</i>	20
Salix tetrasperma.	<i>Willow, four seeded.</i>	20
Sapindus rubiginosus, white.	<i>Soap berry, rusty.</i>	15
Sterculia balanghas, green.	<i>Sterculia, coronet flower.</i>	20
Swietenia mahagoni, red r.	<i>Mahogany tree.</i>	80
Tamarix articulata, pink.	<i>Tamarisk Indian.</i>	30
Taxus elongata.	<i>Yew, long leaved.</i>	20
Tectona grandis, white.	<i>Teak tree.</i>	100
Terminalia angustifolia. . .	<i>Terminalia, narrow leaved.</i>	20
Theobroma cacao, brown r.	<i>Chocolate nut.</i>	16
Wrightia zeylanica, white.	<i>Wrightia, pear leaved</i>	10

## Shrubs.

Acacia scandens, purple.	<i>Acacia, climbing.</i>	10
—— speciosa, purple.	——, <i>splendid.</i>	10
—— discolor, yellow.	——, <i>two colored.</i>	10
—— grandiflora, purple.	——, <i>large flowered.</i>	10
Agave americana, green.	<i>Agave, common American.</i>	2
—— yuccafolia, yellow white v.	——, <i>yucca leaved.</i>	6
Aglaia odorata.	<i>Aglaia, sweet scented.</i>	—
Aloe macra, orange.	<i>Aloe, lean.</i>	3

Aloe, chinensis, yellow. <i>Aloe, Chinese.</i>	4
— spicata, red. —, prickly	4
Amorpha, microphylla, purple. <i>Bastard indigo, dwarf.</i>	$\frac{1}{2}$
— nana, blue. —, pigmy	12
Antidesma paniculata <i>Antidesma, downy.</i>	10
Aralia spinosa, white. <i>Angelica tree,</i>	8
— umbracalifera. <i>Aralia, shady.</i>	12
Arbutus unedo, pink r. <i>Strawberry tree, common.</i>	10
Ardisia elegans, red. <i>Ardisia, elegant.</i>	10
Argyreia cuneata, purple. <i>Silver weed, wedge leaved.</i>	2
Artemisia abrotanum, yellow. <i>Southern wood.</i>	4
— santonica, whitish green. <i>Wormwood, Tartarian.</i>	2
Aspalathus indica, red. <i>Aspalathus, Indian.</i>	3
Aster angustifolia, blue. <i>Aster, narrow leaved.</i>	5
— sericus blue. —, silky.	3
— liratus white. —, ridged leaved.	2
Aucuba japonica, having variegated leaves. <i>Aucuba, blotched.</i>	6
Azalea indica, scarlet, purple, lilac, orange, and white. <i>Azalea, Indian.</i>	6
Berberis sinensis, yellow. <i>Berberis, Chinese.</i>	4
Betonica, pink. <i>Betony.</i>	$1\frac{1}{2}$
Bæbotrys indica, white. <i>Bæbotrys, Indian.</i>	3
Blæria muscosa, white. <i>Blæria, mossy.</i>	1
Bouvardia versicolor, red. <i>Bouvardia, many colored.</i>	2
Brunsfelsia undulata, white. <i>Brunsfelsia wavy.</i>	4
Buddlea neemda, white. <i>Buddlea, Indian.</i>	15
Cactus polyanthus, yellow. <i>Cactus, many flowered.</i>	3
— tuna, yellow —, yellow spined.	3
— elatior, yellow. —. great black spined,	6
Callicarpa cana, purple. <i>Callicarpa, hoary.</i>	3
— macrophylla, pink. —, long leaved.	6
Calligonum pallasier, green white. <i>Calligonum, caspian,</i>	4
Cameraria dubia, orange. <i>Bastard manchineel.</i>	6
Caralluma, adscendens, yellow. <i>Caralluma, ascending.</i>	2
Cassia sennoides, yellow. <i>Cassia, senna-leaved.</i>	3



	Height.
Cassia lanceolata, yellow r. <i>True senna.</i>	3
Calycanthus floridus, brown <i>Allspice.</i>	6
Camellia of various kinds <i>Camellia.</i>	5 to 10
Ceanothus sanguinea, white. <i>Ceanothus, red stalked.</i>	2
Cephalaria rigida, white. <i>Cephalaria, stiff leaved.</i>	2
Cestrum macrophyllum, white. <i>Cestrum, large leaved.</i>	2
Chenolea diffusa, green r. <i>Chenolea, silky.</i>	1
Cheiranthus, orange. <i>Wall flower.</i>	2
Cistus ladaniferus, white. <i>Gum cistus.</i>	4
Clerodendron, nutans, white. <i>Clerodendron, nodding</i>	6
———— macrophyllum, } white and blue.               } —————, large leaved.	8
Croton variegata. <i>Croton, variegated.</i>	10
———— tigium, green. ———, <i>purging.</i>	10
Daphne mezereum, pink, r. <i>Daphne mezereum.</i>	4
Dryandra cuneata, yellow. <i>Dryandra, wedge leaved.</i>	3
Enkianthus quinqueflora pink r. <i>Enkianthus, Canton.</i>	3
Eupatorium dalea, pink. <i>Eupatorium, shrubby.</i>	6
———— asperum, purple. ———, <i>rough.</i>	4
Euphorbia antiquorum, yellow. <i>Spurge, triangular spread-</i> <i>ing.</i>	9
———— clava, do. ———, <i>club.</i>	1
Epacris purpurascens, <i>Epacris, rigid.</i>	3
———— pulchella, pink. ———, <i>sweet scented.</i>	4
Eranthemum pulchellum, blue. <i>Eranthemum, fair.</i>	2
Erythrina ovalis, scarlet. <i>Coral tree, oval.</i>	6
Fuchsia, coccinea, scarlet, r. r. <i>Fuchsia, scarlet.</i>	6
———— gracilis, do. r. r. ———, <i>slender.</i>	3
Gazania rigens, orange r. <i>Gazania, great flowered.</i>	1
Gardenia radicans, white. <i>Gardenia, rooting.</i>	1
———— latifolia, white. ———, <i>broad leaved.</i>	7
———— florida, yellow. <i>Cape jasmine.</i>	5
Genista florida, yellow. <i>Broom, yellow.</i>	6
Grislea tomentosa, red. <i>Grislea, downy.</i>	3
Gnaphalium arboreum, white. <i>Everlasting tree.</i>	6

Goldfussia, isophyllæ. <i>Goldfussia</i> , blue bell.	3
Hakea' parilis, white. <i>Hakea</i> , matched.	6
—— macrocarpa, white. ———, small fruited.	4
Huernia venusta, yellow. <i>Huernia</i> , handsome.	$\frac{1}{2}$
Hibiscus rosea, scarlet. <i>Hibiscus</i> , rose colored.	2
—— syriacus purple white &c. ———, Syrian.	8
—— Africanus, yellow & brown. ———, Africa.	6
Hitchinia glauca. <i>Hitchinia</i> , grey.	
Holmskioldia sanguinea, scarlet. <i>Holmskioldia</i> , blood colored.	8
Hypericum monogynum, yellow. <i>St. John's wort</i> , monogynum.	3
—— calycinum, yellow. ———, large flowered.	2
Indigofera hirsuta, purple. <i>Indigo</i> , hairy leaved.	3
Ixora bandhuca, <del>red</del> color. <i>Ixora</i> , bundhooka.	3
—— coccinea, scarlet. ———, scarlet.	5
—— rosea, pink. ———, highland.	4
—— stricta, scarlet. ———, upright.	4
—— barbata white. ———, bearded.	12
Jasminum laurifolium white. <i>Jasmine</i> , laurel leaved.	4
Jatropha multifida, green. <i>Physic nut</i> , multifid.	3
—— integerrima, red. ———, spicy.	4
Justicia, bicalyculata, lilac. <i>Justicia</i> , Malabar.	3
——, speciosa, pink. ———, beautiful.	2
Kaulfussia amelloides, blue. <i>Kaulfussia</i> , blue.	3
Lantana nivea, white. <i>Lantana</i> , snowy.	4
Leea macrophylla, greenish. <i>Leea</i> , long leaved.	4
Leucadendron, yellow. <i>Silver tree</i> .	1
Leucopogon, lanceolatus, white. <i>Lencopogon</i> , or white beard, small flowered.	12
Lonicera tartarrica, red. <i>Tartarian honey suckle</i> .	10
Malpighia fucata, red. <i>Barbadoes cherry</i> , painted.	10
—— angustifolia, pink. ———, narrow leaved.	7
—— lucida, pink. ———, wedge leaved.	6
—— coccifera, pink. ———, oak leaved.	2
Macrocnemum strictum, white. <i>Macrocnemum</i> , upright.	10

	Height.
Melastoma aspera, pink. <i>Melastoma, rough.</i>	6
———— nepalensis, purple. ———, <i>Nepal.</i>	2
Memecylon zeylanica, white. <i>Memecylon, Ceylonese.</i>	10
Mimosa casta, yellow. <i>Mimosa, chaste.</i>	3
———— rubicaulis, yellow. ———, <i>bramble stalked.</i>	6
Morinda umbellata, white. <i>Indian mulberry.</i>	6
Mussœnda pubescens, yellow. <i>Muscenda, downy.</i>	6
Myoporum accuminatum, white. <i>Myoporum.</i>	3
Myonima multiflora. <i>Myonima, many flowered.</i>	8
Myrtus communis, white. <i>Myrtle, common.</i>	6
Notelœa rigida, white. <i>Southern olive, inflexible.</i>	3
Nerium odorum, red and pink. <i>Oleander, sweet scented.</i>	8
Olea fragrans, white. <i>Olive, sweet scented.</i>	4
Ornithrope serrata, white. <i>Ornithrope, saw leaved.</i>	12
Osbeckia stellata pink. <i>Osbeckia, starry.</i>	1
————. nepalensis, purple. ———, <i>Nepal.</i>	2
Pavetta indica, white. <i>Pavetta, Indian.</i>	4
Pavonia odorata, red. <i>Pavonia, fragrant.</i>	2
Pelargonium of various kinds. <i>Stork's bill, or geranium.</i>	1 to 3
Petaloma myrtilloides, white and yellow. <i>Petaloma bilberry-like.</i>	10
Piранthus punctatus, purple. <i>Piранthus, dotted.</i>	$\frac{1}{2}$
Plumbago rosea, scarlet. <i>Leadwort, rose colored.</i>	2
———— capensis, blue. ———, <i>Cape.</i>	3
———— scandens, white. ———, <i>climbing.</i>	3
Poinciana elata, yellow. <i>Poinciana, smooth.</i>	15
————, pulcherrima, red, } <i>Flower fence.</i>	10
yellow and green.	
Punica nana (double) red. <i>Pomegranite, dwarf.</i>	5
Rhamnus alaternus, green, r. <i>Buckthorn, alaterne.</i>	40
Randia longiflora, white. <i>Randia, long flowered.</i>	4
Robinia guineensis, yellow. <i>Robinia, Guinea.</i>	6
————, rosea, pink. ———, <i>rose colored.</i>	10
Rosa, of all varieties and heights. <i>Rose.</i>	
Rosmarinus officinalis. <i>Rosemary, useful.</i>	4
Ruta graveole <del>is</del> green. <i>Rue common.</i>	3

PLATE III.—*Frontispiece.*

Mode of irrigating extensively.

- a* Posts.
- b* Cross bar.
- c* Bamboos for raising the buckets.
- d* Balancing weights.
- e* Cords for buckets.
- f* Buckets.
- g* Laborers.
- h* Well or drain.
- i* Reservoir for conveyance of the water to the land, or garden.

\* \* \* At the lower part of this plate is shewn another mode of raising water for small heights, by a triangular basket, called a "Soonee."

PLATE IV.—*Facing page 250.*

Plan of a garden containing about eight beegahs.

- 1 House.
- 2 Offices.
- 3 Well.
- 4 Entrance lodge.
- 5, 6 Ornamental flower beds.
- 7 Plant sheds, with temporary coverings, for exotics, &c.  
in the hot weather and rains.
- 8 Decorative pillars, statues, or baskets.
- 9 Shrubbery.
- 10 Beds for vegetables.
- 11 Tank and ghat.
- 12 Pump, or irrigating machine.
- 13 Separate plot for fruit trees.
- 14 Trellis, with statue, obelisk, or other ornamental object.

## Calendar.

### JANUARY.

#### KITCHEN GARDEN.

Plant out Brussels sprouts, sow country radish, plant out Patna onions, sow small red onion, and orache, or lal säg. Plant out red celery in trenches. Sow crook-necked squash, early long warted squash, early scollop squash, and pulwul. Plant out small leaved green sage. Water must be freely given to all vegetables during this month.

#### FRUIT GARDEN.

Cut down the leading shoot of old peach trees, and trim other young plants; also open out, train and prune espalier and standard peaches, and as the blossoms appear, dig a trench for watering round the roots. Manure mango trees, if not done last month. Prune apple and pear trees if in the garden; dig a trench for water round loquat and leechee trees as the blossoms appear. Sow orange pips for stocks. Trim shaddocks. Trim and break off straggling and superfluous branches of fig trees. Thin out decayed shoots, and leaves, and suckers of pine apples, put the latter into a nursery. Train and manure vines, if not done last month.

#### SHRUBBERY AND FLOWER GARDEN.

Fill in the roots of rose trees, not before done.

## FEBRUARY.

## KITCHEN GARDEN.

Sow small red onion for main crop, orache or red and green säg, plant out red celery in trenches if not done last month, sow pulwul and gourds. Water freely all vegetables.

## FRUIT GARDEN.

As the blossoms of the mango appear, make trenches round the mango trees for watering. As the blossoms appear, earth up and manure fruiting pine-apples, digging trenches on each side to fill daily with water. Sow early melons and water melons.

## MARCH.

## KITCHEN GARDEN.

Plant out small red onion, sow orache or red and green säg, cape dwarf cucumber, pulwul, bringal, and gourds; plant out turmeric. Water cannot be given too plentifully to such plants as remain. Dig well for fallowing such parts of the garden as are out of use.

## FRUIT GARDEN.

Thin out pomegranites, biar, &c; thin out the fruit on peach trees, manure and thin out plantains, water the leaves of pine apples once a week, and look over them to remove all side shoots from the fruit stems, and suckers from the roots as they appear; pinch off blossoms from young immature vines. Continue sowing melons, and train those sown last month.

## SHRUBBERY AND FLOWER GARDEN.

Pot ~~pel~~argonomus put out after the rains; cover the roots of delicate shrubs for protection against heat.

## APRIL.

## KITCHEN GARDEN.

Sow Jerusalem artichoke, skirret, and country radish; plant yams, and sweet potatoes; sow orache or red and green sâg. Sow long green cucumber and cape dwarf cucumber, also early scollop squash, toraee; sow and plant out brinjal, sow bird pepper, okro, and gourds plant out ginger and turmeric. Give water freely, and dig and distribute manure wherever the ground is out of use.

## FRUIT GARDEN.

Thin out the fruit on mango trees; put on tin cases to figs for ripening, and thin out superfluous fruit; plant out young plantains; look over pine apples to keep them earthed up and watered, and to remove shoots and suckers; sow late melons and water melons. train melon vines.

## SHRUBBERY AND FLOWER GARDEN.

Look over the trellises and arbours to strengthen them against the coming of the strong winds and storms of this period.

## MAY.

## KITCHEN GARDEN.

Sow mukun seem, Pertab Sing's bean, the winged pea, skirret, and country radish; plant yams, sow orache, or red and green sâg, and Cape dwarf cucumber, early scollop squash, and turace, and plant out bringal; sow Indian corn, and sow okro; plant out ginger, turmeric, and mango ginger. Close in the ground manured as soon as possible after the first shower of rain.

## FRUIT GARDEN.

. Raise mounds round the peach trees to protect the roots from the rains; graft peaches as soon as the fruit is off; sow peach stones to raise stocks, also apple and pear pips, mango stones, apricot stones, &c. for like purpose; graft apples and pears, sow pomegranite seeds, graft oranges, thin the fruit in shaddock trees, case the fruit of figs, make plantations of pine apples, tie up fruiting pine apples below the fruit if the weakness of the stem requires it; sow the seeds of grapes; train melon vines.

## SHRUBBERY AND FLOWER GARDEN.

Make layers of honey suckle, bauhinia and other climbing plants; make layers and pipings of carnations; dig flower borders, and the earth of shrubberies, and give them soil from the bottom of a tank; make new trellises and props before the rains set in.



## JUNE.

## KITCHEN GARDEN.

Sow borcole or kale, mukun seem, Brazilian pea, Assam bean, black bean, orache or red and green sâg. Take up and divide artichokes into nursery beds, and prepare your fruiting beds for the next year. Sow Nepal cucumber, Cape dwarf cucumber, early scollop squash, turace, Indian corn and okro.

## FRUIT GARDEN.

Prepare layers of leeches and grafts of peaches, if not done last month ; graft mangos, and sow seeds of guava ; make layers of pomegranite and shaddock ; make layers of fig trees, and plant out suckers ; make layers of mulberry and raspberry.

## SHRUBBERY AND FLOWER GARDEN.

Make layers and cuttings of hardy shrubs ; divide the roots, and plant out suckers and offsets of perennial border plants ; sow seeds of biennial plants, and make cuttings of biennials propagated by that means ; sow also a few annuals to transplant.

## JULY.

## KITCHEN GARDEN.

Sow Brussels sprouts and borecole, or kale if not done last month, to prick out the middle of the month ; plant sweet potatoe ; sow orache, or red and green sâg ; plant out chives if not too wet ; prepare fruiting beds

for artichokes if not done last month; sow a few cabbage lettuces under shelter; sow Nepal cucumber, Cape dwarf cucumber, turaee, bird pepper, and okro. Plant cuttings of thyme, and of common sage.

#### FRUIT GARDEN.

Plant out young plants of fruit trees if ready; make Chinese grafts of loquats and leeches; make layers or sow seeds of the custard apple; plant out guava plants; make layers of vines; and plant out seedlings.

#### SHRUBBERY AND FLOWER GARDEN.

Sow seeds of pelargonium; transplant young shrubs of a hardy character; plant out and transplant hardy perennial border plants.

### AUGUST.

#### KITCHEN GARDEN.

Sow in pots under shelter early York and early Battersea cabbage, if desired very soon; plant out borecole or kale. Sow early cauliflowers in pots, early peas in a sheltered spot, also dwarf French beans; put in a few early potatoes; sow white carrot; plant sweet potatoes; sow green Nepal spinach, white beet, leek; plant out chives; sow artichoke, cabbage lettuce, endive, white solid celery, Nepal cucumber, Cape dwarf cucumber, large capsicum, Nepal pepper, and okro.

#### FRUIT GARDEN.

Trim apple trees gently, also pear trees if any; remove suckers, and thin out rose apples and plant out

these and slips; plant out vine layers at the close of this month.

#### SHRUBBERY AND FLOWER GARDEN.

Put out pelargoniums as soon as the rains cease. This is the best time for sowing the seeds of hardy shrubs. Remove and plant out suckers and layers of hardy shrubs; transplant delicate and exotic shrubs; divide and plant out the roots and make cuttings of dahlias; remove and plant out suckers and offsets of hardy perennial border plants formed during the rains; plant out tender young perennial border plants; prune shrubs and perennial border plants; plant out biennial border plants; put out hardy annals sown in June; sow annuals.

### SEPTEMBER.

#### KITCHEN GARDEN.

Sow early York and early Battersea cabbage every fortnight, pricking out the August sowings if any; towards the 16th, prick out the early September sowings; sow sugar loaf and drumhead cabbage, also savoy and red cabbage the latter end of the month; sow large cauliflowers for the main crop, and prick out the early sort; sow broccoli; earth up and stick the earliest peas; sow dwarf French beans; plant potatoes; sow Botan turnip, knole kole, white carrot, scarlet radish; plant sweet potatoe; sow round spinach, Spanish spinach, white beet; sow or plant

out poi säg; sow Bombay and Patna onion, small red onion, asparagus, cabbage lettuce, endive, Cape dwarf cucumber, small round tomato, black round pepper, long red pepper, parsley, and basil; divide out mint.

#### FRUIT GARDEN.

Expose the root of peach, loquat, vine, &c., and trim the fibres. Thin out pomegranite, trim down young vines, and prepare beds for strawberries.

#### SHRUBBERY AND FLOWER GARDEN.

Plant out cuttings of pelargonium, and of hardy shrubs; prune flowering shrubs; give annual dressing of manure to the shrubbery and flower border; divide violets, &c. Plant out biennial plants not put out last month; plant out annuals sown in pots; sow annuals; repot and give fresh earth to pots in the plant shed.

### OCTOBER.

#### KITCHEN GARDEN.

Continue sowing early cabbage, and prick out those sown late in September; plant out the first sown in the beginning, and last month's sowings in the middle and end of this month; prick out sugar loaf and drumhead cabbage and savoy; about the 12th prick out red cabbage, and remove again about the 20th; sow a few late cauliflowers, plant out the early sorts, prick out the main crop; prick out broccoli; sow early peas for the main crop, also the early Washington and dwarf, Prussian and marrow fat peas; sow Mazagon bean;

sow dwarf French beans, scarlet runners, and Lima beans; plant potatoes; replant Jerusalem artichoke; sow Botan turnip, and knole kole; plant out knole kole; sow early herb carrot, long orange carrot, parsnip, dwarf red beet, and turnip rooted beet. Towards the close of the month sow long blood beet, scarlet and turnip radish, round prickly spinach, Spanish spinach, white beet, poi säg, Dutch and Portugal onions, small red onion, cabbage lettuce, endive, and plant garlic; plant out white celery in trenches; sow Italian celery, early long warted squash, early scollop squash, large red tomato, small round tomato, parsley, fennel, and dill, small leaved green sage, marjoram, sow anise and coriander.

#### FRUIT GARDEN.

Prune and thin loquat trees, and leechees; trim orange, lemon, and lime trees; open out and trim the roots of vines; plant out strawberry suckers and divisions of the roots for fruiting beds.

#### SHRUBBERY AND FLOWER GARDEN.

Open out the roots of Bussorah roses for early blossoming, and plant out cuttings; sow annuals.

### NOVEMBER.

#### KITCHEN GARDEN.

Plant out the late sown early York and early Battersea cabbage, also sugar loaf and drumhead cab-

bage and savoy; plant out red cabbage early in the month; sow Brussels sprouts to prick out in twenty-five days; plant out cauliflowers and broccoli; sow marrow fat, imperial blue, green marrow, and green *scymetre* peas; sow Windsor beans; sow scarlet runners; sow American flat winter turnip, early Dutch and stone turnip, and Botan turnip; plant out knole kole; sow early bean, long orange carrot, dwarf red beet, turnip-rooted beet, long blood beet, salsify, scarlet and turnip radish, Spanish radish, round spinach and Spanish spinach, and white beet; sow and plant out sorrel; thin out Bombay and Patna onions; sow Portuguese and Dutch onions, and small red onions; plant out leeks; manure and prepare early asparagus beds; sow sea kale; plant out artichokes in fruiting beds; sow cos lettuce, cabbage lettuce, endive, red celery, early long warted squash, scollop squash, and parsley; plant out basil.

#### FRUIT GARDEN.

Prune mango trees that are in espalier, and thin out such as are standard.

#### SHRUBBERY AND FLOWER GARDEN.

Open out the roots of Bussorah roses for succession, also of rose Edward and Madras rose, cutting down the branches; trim sweet briar, and the many flowered rose; divide and replant bulbs; continue to sow annuals.

## DECEMBER.

## KITCHEN GARDEN.

Plant out the late cauliflowers, sow knight's dwarf, and marrow fat peas, and yellow Canada beans; plant out knole kole; sow early horn carrot for a late crop; sow long blood beet, salsify, and turnip radish; plant out Bombay onion; sow small red onions; earth up leeks; manure and make up asparagus beds, flood those made last month for an early crop; plant out artichokes if not done last month; sow cos lettuce, cabbage lettuce, and endive; put out Italian celery in trenches; sow early long warted squash, and early scollop squash.

## FRUIT GARDEN.

Cover in the roots of peach trees; dig round the roots of the mango trees and give them manure; train fruiting vines, and fill in the roots with manure and rich earth.

## SHRUBBERY AND FLOWER GARDEN.

Open out the roots and prune such rose trees as are for late blossoming, prune China and Persian roses, &c.

## Produce of the Garden.

### JANUARY.

*Vegetables.* Early York and early Battersea cabbage, sugar loaf cabbage, drumhead cabbage, savoy, cauliflower, broccoli, marrow-fat pea, imperial blue pea, green marrow pea, Mazagon bean, dwarf Canada bean, potatoe, American flat turnip, early dwarf and stone turnip, knole kole, early horn carrot, dwarf red beet, turnip-rooted beet, long blood beet, turnip radish, white beet, sorrel, cos-lettuce, cabbage lettuce, endive, Italian celery, scollop squash, large and small tomato, gourd, brinjal.

*Fruit.* Bair, orange, plantains, a few pine-apples but not in perfection, a few early or forced loquats, tipparee.

### FEBRUARY.

*Vegetables.* Red drumhead sugar loaf, and early York cabbage, late cauliflower, knight's pea, marrow-fat pea, Windsor bean, Lima bean, scarlet runner, mukunseem, potatoe, knole kole, early horn carrot, large orange carrot, parsnip, turnip-rooted beet, long blood beet, salsify, country radish, white beet, sorrel, orache or red sag, leek, asparagus, cos lettuce, cabbage lettuce, endive, scollop squash, large tomato, okro, gourd.

*Fruits.* Loquat, bullock's heart, strawberry, custard apple, but not good, mulberry, strawberry, guavar in perfection, guavas.



## MARCH.

*Vegetables.* Sugar-loaf cabbage, Brussels sprout, knight's pea, marrow fat pea, Lima bean, scarlet runner, mukunseem, Brazilian pea, potatoe, knole kole, early horn carrot, large orange carrot, long blood beet, salsify, white beet, sorrel, orache or red and green sâg, leek, asparagus, endive, red celery, long warted squash, scollop squash, pulwul, large tomato, long red pepper, okro.

*Fruit.* Rose apple, loquat, leechie, bullock's heart, strawberry, water melon.

## APRIL.

*Vegetables.* Lima bean, mukunseem, potatoe, sugar-loaf cabbage, early horn carrot, long blood beet, salsify, sweet potatoe, white beet, orache, or red and green sâg, leek, asparagus, artichoke, red celery, dwarf cucumber, crook, necked squash, scollop squash, pulwul, large tomato, okro, gourd.

*Fruit.* Peach, apricot, mango, apple, pear, rose apple, leechie, bullock's heart, melon, water melon, corinda.

## MAY.

*Vegetables.* Potatoe, salsify, sweet potatoe, large onion, small red onion, orache or red and green sâg, leek, garlic, asparagus, artichoke, dwarf cucumber, pulwul, turace, large tomato, gourd, cabbage sprouts.

*Fruit.* Peach, mango, rose apple, leechie, wampee, jack fruit, fig, pine apple, grape, melon, water melon, jumrool, pomegranite, custard apple, papiah.

## JUNE.

*Vegetables.* Potatoe, country radish, sweet potatoe, small red onion, red and green sâg, asparagus, artichoke, dwarf cucumber, long warted squash, turace, large tomato, brinjal, gourd.

*Fruit.* Longan, wampee, sweet sop, fig, pine-apple, grape, melon, mango, a few peaches, guava, papiah, shaddock.

## JULY.

*Vegetables.* Pertab Sing's bean, potatoe, country radish, red and green sâg, asparagus, long green cucumber, dwarf cucumber, long warted squash, turace, brinjal, Indian corn, okro.

*Fruit.* Wampee, bullock's heart, sweet sop, fig, pine-apple, guava, cumrunnga, corinda, papiah.

## AUGUST.

*Vegetables.* Assam bean, winged pea, potatoes but indifferent, red and green sâg, asparagus, Nepal cucumber, dwarf cucumber, long warted squash, turace, brinjal, Indian corn, okro, mukunseem.

*Fruit.* Sweet sop, bullock's heart, alligator or avocado pear, a few pine-apples but indifferent, guava.

## SEPTEMBER.

*Vegetables.* Borecole or kale, a few very early peas, Assam bean, black bean, yam, green Nepal spinach, small cabbage lettuce, dwarf cucumber, Nepal cucumber, brinjal, Indian corn.

*Fruit.* Sweet sop, guava, shaddock.

## OCTOBER.

*Vegetables.* Turnip, skirret, scarlet radish, yam, sweet potatoe, round spinach, Spanish spinach, cabbage lettuce, small endive, Nepal cucumber, dwarf cucumber.

*Fruit.* Sweet sop, pomegranite.

## NOVEMBER.

*Vegetables.* Early York and early Battersea cabbage, cauliflower, early pea for regular succession, dwarf French beans, early new potatoes, Botan turnip, knole kole, white carrot, skirret, scarlet and turnip radish, yam, sweet potatoe, round and prickly spinach, Spanish spinach, white beet, young onion, cabbage lettuce, endive, Nepal cucumber, dwarf cucumber, large capsicum, Nepal pepper, okro.

*Fruit.* Orange, shaddock, scarce, papiah, plantain.

## DECEMBER.

*Vegetables.* Early York and early Battersea cabbage, savoy, cauliflower, early pea, dwarf French bean, potatoes, early dwarf turnip, knole kole, white carrot, dwarf red beet, scarlet turnip, and Spanish radish, yam, sweet potatoe, round spinach, white beet, cos lettuce, cabbage lettuce, endive, white solid celery, scollop squash, small tomato, black round pepper, okro, brinjal.

*Fruit.* Orange, Tippiaree, plantain.

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(*The Hindoostanee Words in Italics.*)

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